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THE NAVY MANUFACTURING TECHNOLOGY ELECTRONICS STUDY. A PLAN FOR--ETC(U)  
JUN 77 N00039-77-C-0095

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**SAI-MT-2010-VOL-2**

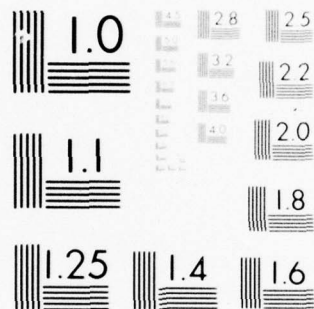
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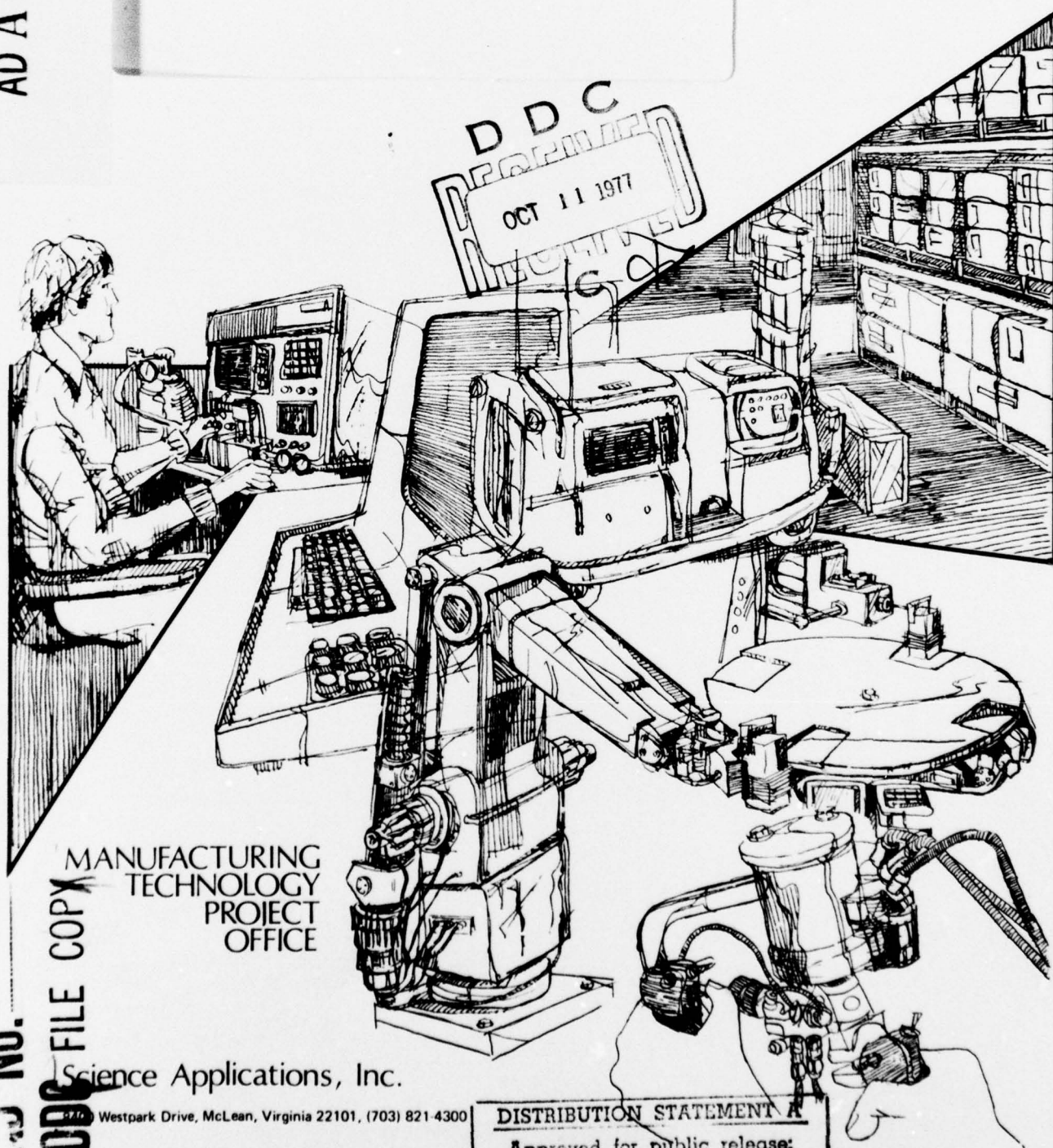


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THE NAVY MANUFACTURING TECHNOLOGY  
ELECTRONICS STUDY - A PLAN FOR  
COST EFFECTIVE ELECTRONICS  
IN THE NAVY.

Volume II,  
A CANDIDATE ELECTRONICS  
MANUFACTURING TECHNOLOGY PLAN.

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This report was prepared for internal Navy planning purposes only. The data contained herein, while accurate at the time of publication (June 1977), may be subject to frequent revision. It is expected that the program described will be further developed prior to Fiscal Year 1980 due to further review, new technological inputs, and changing procurement priorities. The U.S. Navy is not presently committed or obligated in any way to carry out or follow all or any of the specific projects or recommendations described herein.

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Washington, D.C. 20360  
Prepared by:  
SAI Manufacturing Technology Project Office

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## MANUFACTURING TECHNOLOGY STUDY

### INTRODUCTION

This volume contains a candidate manufacturing technology (MT) plan for Navy electronics formulated as a result of the study described briefly in Volume I and in detail in Volume III of this report. The purpose of this volume is to give information on the aspects of the program such as:

- (1) savings minus investment,
- (2) savings to investment ratio,
- (3) timeframe,
- (4) applicable weapons systems,
- (5) manufacturing cost category of cost savings

on an overall, as well as individual, project basis.

The following general rules were followed in setting up the program:

- Project costs were obtained in present dollars from firms. Implementation costs for one production line were included if appropriate. Further costs to implement at additional lines are not included as it is possible that such activities would not be funded out of the Navy MT program.
- Timeframe estimates were obtained in addition. The earliest any new project was started was FY80. since the FY78 and 79 MT plans are already fairly firm. However, if appropriate, suggestions for reprogramming of funds in FY79 were included.
- Project savings, in present value dollars, were estimated from industrial estimates of cost savings (weighed for technical risk) assuming that the project was successful.
- Cost savings categories - as developed in Vol. I, Table 5a, b, for each project are reported and projects are ranked by category.
- Weapons systems of applicability for the projects are listed, and projects are ranked by the applicable weapon system of savings impact.

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Rankings by highest savings minus investment are given. Savings to investment ratio is calculated in addition. A study of the variation of rank due to changes of the standard interest rates of 10 percent and annual inflation of 4 percent indicated little sensitivity to these parameters.

### LIST OF PROJECTS

The titles of the 101 candidate projects are given in Table 1 in order of an arbitrary index assigned. More detailed descriptions of each project are found in Appendix A of Volume III.

### PROJECT RATING

Projects were rated by expected savings minus investment and savings to investment ratio. Table 2 contains a prioritized list by highest net gain.

Projects were evaluated initially on a 4-year procurement cycle for cost savings, assuming both that all projects would be successful, and that their savings are applied to all electronics in the related class (e.g., a cost savings for one project in missile electronics is applied at the end of the project to all missile electronics). This procedure produces favorable returns, and is used uniformly for all projects. In order to estimate the effect of cutting out projects with lower S/I on savings, a sample of 93 projects were studied as to the joint distributions of these variables. Figure 1 shows the distribution of savings to investment ratio (S/I) for a sample of 93 out of 101 projects rated as described. The scale is linear in project number, but logarithmic in S/I. Note a "tail" of low return projects superimposed on a typical log-normal distribution. If one cuts all projects with an S/I of 3.2 or less (14 projects), the tail largely disappears. Figure 2 shows the expected savings (the average of nominal and risk adjusted) on a similar plot. The dotted lines show the effect of removal of the 14 projects on the low S/I criteria. Again this produces a log-normal distribution, this time in project savings. A cut on projects S/I 3.2 or less on the set of 101 projects would produce a project sample of 82 projects. These plots were made with interim project data, and the cut was reinvestigated when final report data was available. The

## MANUFACTURING TECHNOLOGY STUDY

overall effect of the cut is to increase S/I by about 20%. There may be other reasons for including projects that have a low S/I. One factor may be large indirect benefits such as lower weight (particularly for missile and avionics systems).

Projects ranked by highest net gain (gain = savings-investment) but savings to investment ratios are listed also in the computer output. These ratings are based on current best information as of mid FY77 but updates to project costing due to altered technological risk factors and changed procurement projections will vary ranking prior to FY80.

### PROJECTS RATED BY COST SAVINGS CATEGORIES

Projects were aggregated into the appropriate cost savings category and summarized. The cost categories are those used in Volume I, Table 4a, b, and printed in the output in an abbreviated form (Table 3). In the output x indicates the Table 4a product cost factor, and y the Table 4b process cost factors.

### PROJECTS RATED BY MAJOR WEAPON PROCUREMENT

Lists of the projects rated against major weapons procurements, missiles, aircraft, ships and other electronics are presented in the output in format similar to that used previously where appropriate project savings are allocated to specific Navy weapon systems by the NEMTA program. The following table, Table 4, shows this allocation. In many cases projects are applied to more than one weapons system; however, the cost for multiple application is not accounted for as it is possible that the further implementation will not be funded directly by MT funding.

### PROJECT RECOMMENDATIONS FOR FY82 to 84

The out-years FY82 to 84 represent an opportunity for increased benefit from manufacturing technology by addressing indirect costs. Reduced weight and power consumption and increased reliability affected by improvements in manufacture ought to be used as additional criteria in project selection. Many projects begun in the FY80-81 timeframe will



## MANUFACTURING TECHNOLOGY STUDY

nature into effective cost saving mechanisms. Table 5 represents a compendium of key technology for costs for the period 1978 to 1990 and Table 6 lists programs already identified in this study that are apparently responsive to the future projected needs.

Naturally these projects will evolve, new technologies will emerge and procurement priorities will change; however, at this point in time (mid 1977) it appears that the candidate Navy MT program does have a future oriented component that will serve as a framework for the program in the FY82-84 timeframe.

### SUMMARY

A candidate plan has been outlined involving a number of elements, and methods to select projects have been advanced. Certain projects are too specialized to be rated versus the broad categories used initially (Table 3), yet are good candidates when analyzed for specific weapons procurements (Table 4). If all projects from Table 3 of S/I 2.9 or greater are included along with projects 28, 44, 60, 75 and 78 which rate well from Table 4 (specific systems application), a present value program of 31.3M worth of projects returning between 580 and 825M in savings over a 4-year period is indicated. The average S/I is 22 with an average project cost of 401K.

# MANUFACTURING TECHNOLOGY STUDY

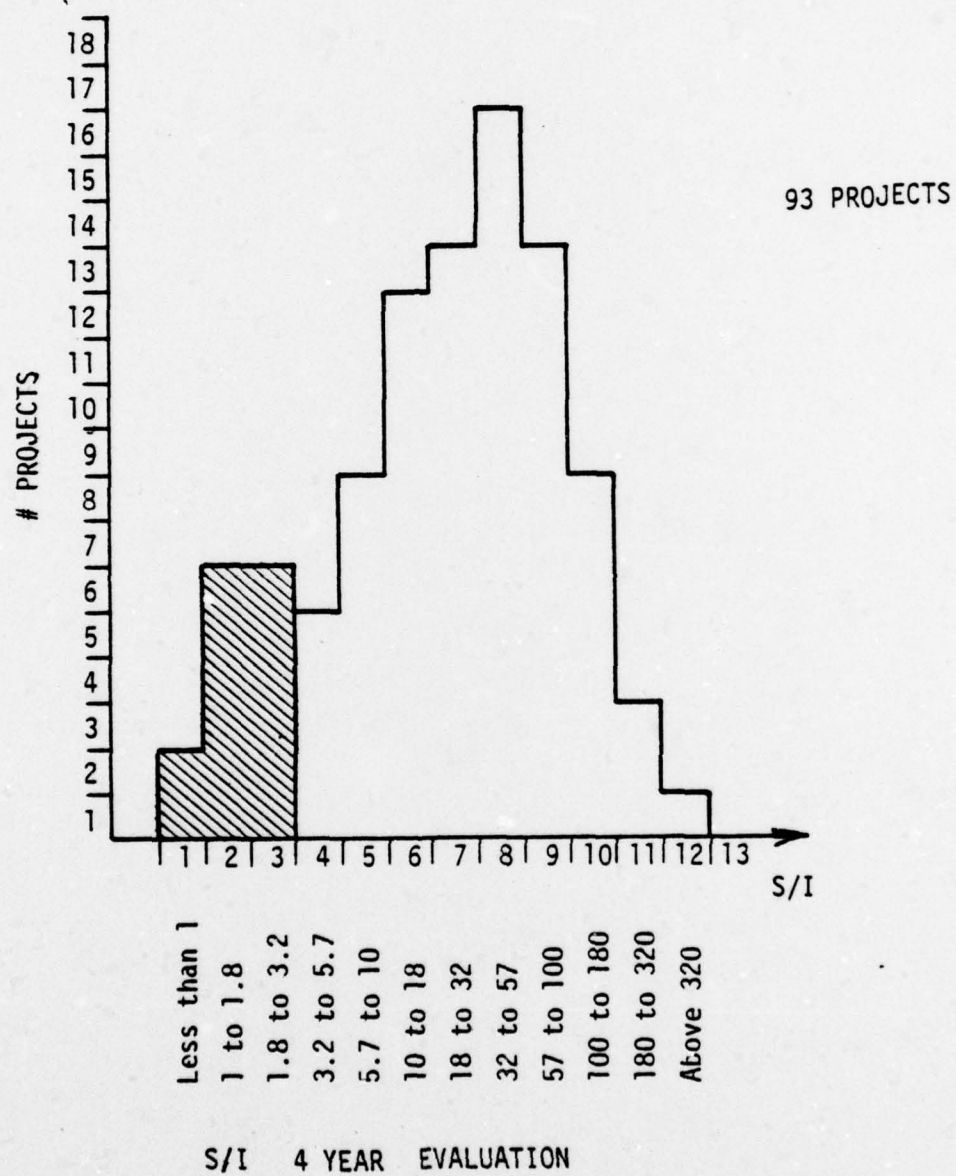
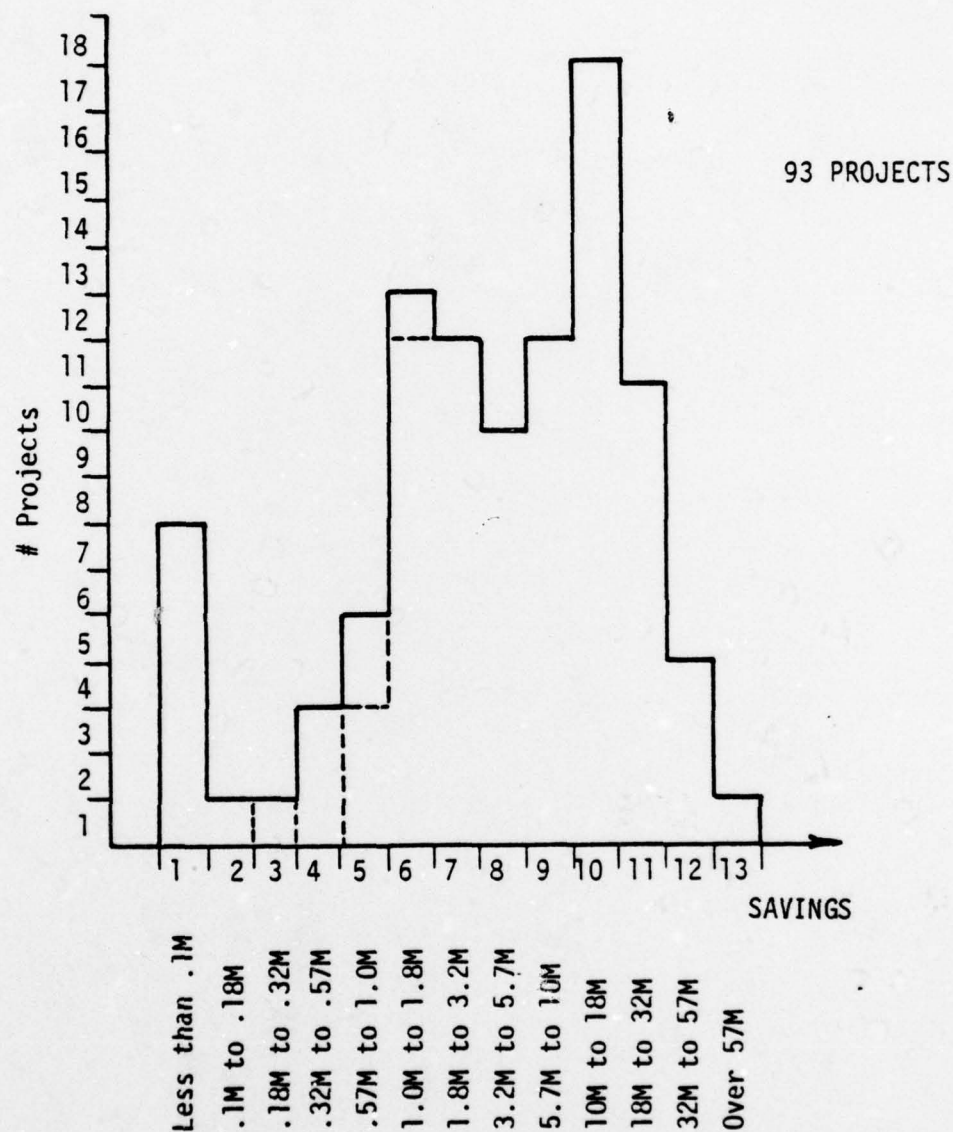


Figure 1. Distribution of Savings-to-Investment Ratio



# MANUFACTURING TECHNOLOGY STUDY



(S-I) 4 YEAR EVALUATION

Figure 2. Distribution of Expected Savings

Table 1  
List of Candidate Electronics MT Projects

| <u>Proj.No.</u> | <u>Title</u>   |
|-----------------|--|
| 1               | Metal Core PCB   |
| 2               | Conformal Coating - Moisture Seals                         |
| 3               | Group Technology/Parts Classification                      |
| 4               | Cost Savings via Standardized Soldering Specifications     |
| 5               | Smear Free Interconnect Holes - PCB                        |
| 6               | Computer Controlled Pattern Printing                       |
| 7               | Automatic Gang Probing of Multilayer Thick Film Substrates |
| 8               | Revision of Rework Standards - Hybrid Circuits             |
| 9               | Vapor Soldering - Automated Assembly                       |
| 10              | Interactive Fault Isolation Software                       |
| 11              | Data Link - Supplier/Assembler                             |
| 12              | Automated Fault Isolation                                  |
| 13              | Automated Hybrid Circuit Assembly Justification            |
| 14              | Low Cost Hybrid via Redesign for Manufacturability         |
| 15              | Manufacturing Methods for Magnetic Components              |
| 16              | Automated Laser Bonder for Hybrid Microelectronics         |
| 17              | Computerized Ion Beam Resistor Trimming                    |
| 18              | SAW Device Replication                                     |
| 19              | Leadless Inverted Devices                                  |
| 20              | R. F. Packaging Techniques                                 |
| 21              | Electron Beam Imaging System                               |
| 22              | Electron Bombarded Device MT                               |
| 23              | Thin Silicon Layer Technology                              |
| 24              | High Dose Shallow Profile Ion Implantation Systems         |
| 25              | Encoder Improvement Program                                |
| 26              | Evaluation of Electrochemical Etching Process              |
| 27              | Adaption Control of Drill Temp - PCB Board Application     |
| 28              | Coaxial Magnetron-Design for Manufacture                   |
| 29              | Manufacturing Methods - Frequency Agile Magnetrons         |
| 30              | "Nasglow" Plating on Connectors                            |
| 31              | Low Cost Machine Insertable Tantalum Capacitors            |
| 32              | Fibre Optics Signal Cables                                 |

Table 1  
List of Candidate Electronics MT Projects  
- continued -

| <u>Proj.No.</u> | <u>Title</u>   |
|-----------------|--|
| 33              | GaAs FET/Replacement for TWT                               |
| 34              | Patterned Polyimide-Siloxane Coatings                      |
| 35              | Ultra Thin Copper Clad Laminates                           |
| 36              | Lightweight R. F. Stripline Assembly                       |
| 37              | Low Cost Microchannel Plates                               |
| 38              | GaAs Microwave Circuits - Manufacturability                |
| 39              | NMOS Memory-Tri Metal ROM                                  |
| 40              | Low Cost Polyimide MW-PWB's                                |
| 41              | Semi-Automated Minature TWT Assembly                       |
| 42              | Not Used   |
| 43              | Large Scale Hybrid Assembly and Test-Automation            |
| 44              | Computer Controlled Machine Tools                          |
| 45              | Improved/Automated Standard Machining Processes            |
| 46              | Automated PCB Insertion                                    |
| 47              | Flat Wire Interconnects                                    |
| 48              | Automatic Sonar Test Equipment                             |
| 49              | Microprocessor Replacement in Digital Sonars               |
| 50              | Automated Wiring System                                    |
| 51              | Computer Processed Shop Instructions                       |
| 52              | Substitution of Gold Plating - Interconnections            |
| 53              | Mechanized Fabrication-Flexible Multilayer PCB             |
| 54              | Water-Soluble Organic Flux Flow Soldering                  |
| 55              | HF Removal Technique-Drill Smear PCB                       |
| 56              | Automated Cable Harness Manufacture                        |
| 57              | N/C Cable Harness Assembly Machine                         |
| 58              | Environmental Test Automation                              |
| 59              | Automated Optical Inspection PCB                           |
| 60              | Near Field Antenna Measurement                             |
| 61              | Production Test Modeling                                   |
| 62              | Improved Analog Circuit Automated Fault Isolation Software |



Table 1  
List of Candidate Electronics MT Projects  
- continued -

| <u>Proj.No.</u> | <u>Title</u>   |
|-----------------|--|
| 63              | Improved Test Methods - MOS-Rad Hard IC's                      |
| 64              | Automated PCB Board Test Equipment Development                 |
| 65              | Ribbon Sapphire  |
| 66              | CMOS Custom Library  |
| 67              | N/C Machine Calibration  |
| 68              | Thick Film Printed Hybrid Seals                                |
| 69              | Plastic Molded Microwave Components                            |
| 70              | Laser Welding of Cabinets                                      |
| 71              | Projection Printing SAW Device Manufacturing                   |
| 72              | Increased Median Technology Level via Contractor Short Courses |
| 73              | N/C Placement of Components and Reflow Solder                  |
| 74              | Semi-Automated Core Stringing                                  |
| 75              | Improved Hole Etching/Striplines                               |
| 76              | CAD for Wire Harness - Software                                |
| 77              | Advanced N/C Machine Controller                                |
| 78              | Laser Welding - Core Memories                                  |
| 79              | "Silk Screen" Printing for PCB's                               |
| 80              | Quick Reaction - Change Capability                             |
| 81              | Effective Utilization of Automation Interfaces                 |
| 82              | Hierarchical Control Program/Robotics                          |
| 83              | Tactile/Visual Sensors on Robotic Arms                         |
| 84              | Reembodiment of Semi Conductors in LSI                         |
| 85              | Fibre Optics Integrated Structure - Airframe                   |
| 86              | Glue Process Avionics Chassis                                  |
| 87              | Plastic H.V. Power Sup. Cabinets                               |
| 88              | III, V Compound Crystal Growth                                 |
| 89              | GaAs FET Yield Improvement                                     |
| 90              | Epitaxial YIG Microwave Filters                                |
| 91              | Piezoelectric Polymer Films                                    |
| 92              | Composite Materials in Optical Assemblies                      |
| 93              | Diamond Turned Plastic Lenses                                  |

Table 1  
List of Candidate Electronics MT Projects  
- continued -

| <u>Proj.No.</u> | <u>Title</u>  |
|-----------------|---|
| 94              | Vacuum Lock Coating System                          |
| 95              | Automated Photo-Cathode System                      |
| 96              | Not Used  |
| 97              | Monolithic Focal Plane Detector - Manufacturability |
| 98              | CMOS/SOS Manufacturability Study                    |
| 99              | Laser Inspection of Hybrid Circuits                 |
| 100             | Low Cost Monolithic Ceramic Capacitors              |
| 101             | Closed Circuit Cleaning of PCB's                    |
| 102             | Component Assembly - Automated Operator Assistance  |
| 103             | Ink Jet Wire Marking System                         |

## TABLE 2

### Notes to Assist in Reading this Output

The project in the output title is a 20 character abbreviation used for convenience, see Table 1 for exact title of the projects.

The symbol x is used for the product cost category - reference Table 4a Volume I, an abbreviated description is given in output.

The symbol y is used for the process cost category - reference Table 4b Volume I, an abbreviated description is given in output.

Table 2

## NAVY MANUFACTURING TECHNOLOGY FIVE YEAR PROGRAM

| PRIOR NO. | PROJ NO. | PROJECT TITLE        | PROJECT COST (\$ THOUSANDS)<br>ANTICIPATED SAVINGS (\$ THOUSANDS) |       |       |        |        |         |         |         |         |         |  |  |
|-----------|----------|----------------------|---|-------|-------|--------|--------|---------|---------|---------|---------|---------|--|--|
|           |          |                      | FY 78   | FY 79 | FY 80 | FY 81  | FY 82  | FY 83   | FY 84   | FY 85   | FY 86   | FY 87   |  |  |
| 1         | 12       | AUTO FAULT ISOLATION | 0.0   | 0.0   | 100.0 | 100.0  | 0.0    | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |  |  |
| 2         | 59       | PCB OCR INSP. A266   | 0.0   | 0.0   | 200.0 | 300.0  | 300.0  | 45041.6 | 9110.6  | 8497.9  | 0.0     | 0.0     |  |  |
| 3         | 61       | TEST OPTM MODEL A213 | 0.0   | 0.0   | 0.0   | 0.0    | 0.0    | 16731.0 | 15271.6 | 15271.6 | 13491.4 | 11806.9 |  |  |
| 4         | 85       | FBR-OPT INT STR A311 | 0.0   | 0.0   | 150.0 | 200.0  | 0.0    | 7860.9  | 16731.0 | 15271.6 | 13491.4 | 0.0     |  |  |
| 5         | 32       | FIB OPT SIG CBL A314 | 0.0   | 0.0   | 250.0 | 250.0  | 150.0  | 0.0     | 7937.9  | 14240.1 | 12945.6 | 10973.5 |  |  |
| 6         | 52       | ELEC CONNECPLATEA502 | 0.0   | 0.0   | 150.0 | 200.0  | 0.0    | 9826.1  | 10456.9 | 9544.7  | 0.0     | 0.0     |  |  |
| 7         | 50       | AUTO WIRE SYS        | 0.0   | 0.0   | 500.0 | 1000.0 | 1000.0 | 4191.2  | 7620.4  | 10391.5 | 0.0     | 0.0     |  |  |
| 8         | 84       | RE-EMBODIMENT LSI    | 0.0   | 0.0   | 200.0 | 250.0  | 500.0  | 4750.0  | 8636.5  | 7851.3  | 0.0     | 0.0     |  |  |
| 9         | 87       | PLAC HV CABS A773    | 0.0   | 0.0   | 150.0 | 150.0  | 0.0    | 6985.4  | 6350.3  | 5773.0  | 0.0     | 0.0     |  |  |
| 10        | 23       | THINSLAYRTEC DNAS66  | 0.0   | 0.0   | 550.0 | 400.0  | 150.0  | 2945.0  | 6477.3  | 5810.0  | 0.0     | 0.0     |  |  |
| 11        | 101      | CL-CR.CL.PCB A807    | 0.0   | 0.0   | 95.0  | 0.0    | 0.0    | 4619.7  | 5080.3  | 0.0     | 0.0     | 0.0     |  |  |
| 12        | 80       | OK REACTON CNG.CAP.  | 0.0   | 0.0   | 500.0 | 600.0  | 1000.0 | 4694.2  | 6045.5  | 5819.2  | 0.0     | 0.0     |  |  |
| 13        | 4        | SOLDER SPC.IPLACE    | 0.0   | 0.0   | 350.0 | 350.0  | 0.0    | 4417.0  | 5668.2  | 5241.6  | 0.0     | 0.0     |  |  |
| 14        | 3        | GROUP TECH/PARTS CLS | 0.0   | 0.0   | 180.0 | 160.0  | 245.0  | 1840.4  | 3542.6  | 6552.0  | 0.0     | 0.0     |  |  |
| 15        | 66       | CMOS CUSTOM LIB A124 | 0.0   | 0.0   | 250.0 | 250.0  | 250.0  | 4750.0  | 4318.2  | 3925.7  | 0.0     | 0.0     |  |  |
| 16        | 86       | GLUE AV-CHAS A802    | 0.0   | 0.0   | 100.0 | 0.0    | 0.0    | 3725.5  | 4762.7  | 0.0     | 0.0     | 0.0     |  |  |
| 17        | 43       | LSHYBRID ASSY A116A  | 0.0   | 0.0   | 150.0 | 150.0  | 0.0    | 2095.6  | 6350.3  | 3463.6  | 0.0     | 0.0     |  |  |
| 18        | 54       | WATERSOLFLUXSOL A862 | 0.0   | 0.0   | 300.0 | 150.0  | 0.0    | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |  |  |



|    |    |                      |     |     |        |        |        |        |        |        |     |     |
|----|----|----------------------|-----|-----|--------|--------|--------|--------|--------|--------|-----|-----|
| 17 | 43 | LSHYBRID ASSY A116A  | 0.0 | 0.0 | 2026.5 | 4610.3 | 3725.5 | 4762.7 | 0.0    | 0.0    | 0.0 | 0.0 |
| 18 | 54 | WATERSOLFLUXSOL A862 | 0.0 | 0.0 | 0.0    | 150.0  | 0.0    | 0.0    | 0.0    | 0.0    | 0.0 | 0.0 |
|    |    |                      | 0.0 | 0.0 | 0.0    | 0.0    | 2095.6 | 6350.3 | 3463.8 | 3168.9 | 0.0 | 0.0 |
|    |    |                      | 0.0 | 0.0 | 0.0    | 150.0  | 0.0    | 0.0    | 0.0    | 0.0    | 0.0 | 0.0 |
|    |    |                      | 0.0 | 0.0 | 0.0    | 0.0    | 1086.6 | 4015.4 | 3665.2 | 3237.9 | 0.0 | 0.0 |

# NAVY MANUFACTURING TECHNOLOGY FIVE YEAR PROGRAM

| PROJ      |               | PROJECT COST (\$ THOUSANDS)        |       |       |       |        |        |        |        |        |       |     |
|-----------|---------------|------------------------------------|-------|-------|-------|--------|--------|--------|--------|--------|-------|-----|
| PRIORITY  |               | ANTICIPATED SAVINGS (\$ THOUSANDS) |       |       |       |        |        |        |        |        |       |     |
| PRIOR NO. | PROJECT TITLE | FY 78                              | FY 79 | FY 80 | FY 81 | FY 82  | FY 83  | FY 84  | FY 85  | FY 86  | FY 87 |     |
| 19        | 65            | RIBBON SAPPHIRE                    | 0.0   | 0.0   | 250.0 | 250.0  | 250.0  | 0.0    | 0.0    | 0.0    | 0.0   | 0.0 |
| 20        | 70            | LASER WELDING CABINT               | 0.0   | 0.0   | 0.0   | 0.0    | 2159.1 | 3925.7 | 3568.8 | 3244.3 | 0.0   | 0.0 |
| 21        | 30            | SUB AU PN PLATE A501               | 0.0   | 0.0   | 0.0   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0   | 0.0 |
| 22        | 24            | ION IMPLANTATION DNA44             | 0.0   | 0.0   | 0.0   | 0.0    | 3175.2 | 2886.5 | 2624.1 | 0.0    | 0.0   | 0.0 |
| 23        | 53            | MECH FLEXRC PCB A880               | 0.0   | 0.0   | 100.0 | 50.0   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0   | 0.0 |
| 24        | 35            | ULTRATHIN MICROC A72               | 0.0   | 0.0   | 0.0   | 0.0    | 3175.2 | 2886.5 | 2624.1 | 0.0    | 0.0   | 0.0 |
| 25        | 16            | HYBRD LAS BND DNA579               | 0.0   | 0.0   | 250.0 | 150.0  | 0.0    | 0.0    | 0.0    | 0.0    | 0.0   | 0.0 |
| 26        | 17            | IONRESISTTRIM DNA577               | 0.0   | 0.0   | 0.0   | 1380.0 | 2509.7 | 2290.7 | 0.0    | 0.0    | 0.0   | 0.0 |
| 27        | 51            | COMP SHOP INSTRUCT                 | 0.0   | 0.0   | 200.0 | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0   | 0.0 |
| 28        | 98            | CMOS/SOS MANU A1258                | 0.0   | 0.0   | 0.0   | 0.0    | 1905.1 | 1731.9 | 0.0    | 0.0    | 0.0   | 0.0 |
| 29        | 13            | AUTO-HYB ASMBLY                    | 0.0   | 0.0   | 0.0   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0   | 0.0 |
| 30        | 21            | EL 8M L91 CIR DNA415               | 0.0   | 0.0   | 250.0 | 150.0  | 0.0    | 0.0    | 0.0    | 0.0    | 0.0   | 0.0 |
| 31        | 102           | OP-ASST.ASSMBL A805                | 0.0   | 0.0   | 0.0   | 0.0    | 2159.1 | 1962.8 | 1784.4 | 0.0    | 0.0   | 0.0 |
| 32        | 5             | PCB SHEAR FREE HOLES               | 0.0   | 0.0   | 0.0   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0   | 0.0 |
| 33        | 77            | AV-NC MACH CONTROL                 | 0.0   | 0.0   | 200.0 | 200.0  | 0.0    | 0.0    | 0.0    | 0.0    | 0.0   | 0.0 |
| 34        | 69            | PLASTIC MICROWV COMP               | 0.0   | 0.0   | 0.0   | 0.0    | 1511.4 | 1454.8 | 0.0    | 0.0    | 0.0   | 0.0 |
| 35        | 72            | TECH SM.COURSE                     | 0.0   | 0.0   | 600.0 | 1000.0 | 0.0    | 0.0    | 0.0    | 0.0    | 0.0   | 0.0 |
| 36        | 26            | PCB ELCHEM ETCH A832               | 0.0   | 0.0   | 0.0   | 0.0    | 1813.7 | 1745.8 | 0.0    | 0.0    | 0.0   | 0.0 |
|           |               |                                    | 0.0   | 0.0   | 96.0  | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0   | 0.0 |
|           |               |                                    | 0.0   | 0.0   | 0.0   | 1472.0 | 1336.5 | 1221.7 | 0.0    | 0.0    | 0.0   | 0.0 |



| NAVY MANUFACTURING TECHNOLOGY FIVE YEAR PROGRAM |    |                                    |       |       |       |        |        |        |        |        |       |       |
|---|----|------------------------------------|-------|-------|-------|--------|--------|--------|--------|--------|-------|-------|
| PROJ  |    | PROJECT COST (\$ THOUSANDS)        |       |       |       |        |        |        |        |        |       |       |
| PRIOR NO.                                       |    | ANTICIPATED SAVINGS (\$ THOUSANDS) |       |       |       |        |        |        |        |        |       |       |
|   |    | PROJECT TITLE                      | FY 78 | FY 79 | FY 80 | FY 81  | FY 82  | FY 83  | FY 84  | FY 85  | FY 86 | FY 87 |
| 35  | 72 | TECH SM. COURSE                    | 0.0   | 0.0   | 400.0 | 1000.0 | 0.0    | 0.0    | 0.0    | 0.0    | 0.0   | 0.0   |
|   |    |                                    | 0.0   | 0.0   | 0.0   | 1463.0 | 1877.7 | 1813.7 | 1745.8 | 0.0    | 0.0   | 0.0   |
| 36  | 26 | PCB ELCMEN ETCM A832               | 0.0   | 0.0   | 96.0  | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0   | 0.0   |
|   |    |                                    | 0.0   | 0.0   | 0.0   | 1472.0 | 1257.7 | 1338.5 | 1221.7 | 0.0    | 0.0   | 0.0   |
| 37  | 36 | LIGHTWT RF STRIPLINE               | 0.0   | 0.0   | 120.0 | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0   | 0.0   |
|   |    |                                    | 0.0   | 0.0   | 845.2 | 1536.8 | 1397.1 | 1270.1 | 0.0    | 0.0    | 0.0   | 0.0   |
| 38  | 11 | DATA LNK-SUPPLR/ASMB               | 0.0   | 0.0   | 50.0  | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0   | 0.0   |
|   |    |                                    | 0.0   | 0.0   | 0.0   | 826.8  | 1464.1 | 1366.6 | 1274.7 | 0.0    | 0.0   | 0.0   |
| 39  | 79 | SLK SCRPN PRNTNG PCB8              | 0.0   | 0.0   | 150.0 | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0   | 0.0   |
|   |    |                                    | 0.0   | 0.0   | 811.4 | 1475.3 | 1341.2 | 1219.3 | 0.0    | 0.0    | 0.0   | 0.0   |
| 40  | 55 | SMEARFREEPC8 A836                  | 0.0   | 0.0   | 150.0 | 100.0  | 0.0    | 0.0    | 0.0    | 0.0    | 0.0   | 0.0   |
|   |    |                                    | 0.0   | 0.0   | 0.0   | 737.7  | 1341.2 | 1219.3 | 1108.4 | 0.0    | 0.0   | 0.0   |
| 41  | 56 | AUTOCBLHARNSS A830                 | 0.0   | 0.0   | 350.0 | 200.0  | 0.0    | 0.0    | 0.0    | 0.0    | 0.0   | 0.0   |
|   |    |                                    | 0.0   | 0.0   | 0.0   | 0.0    | 698.5  | 1270.1 | 1154.6 | 1049.6 | 0.0   | 0.0   |
| 42  | 68 | H-BRID SEAL RINGS                  | 0.0   | 0.0   | 70.0  | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0   | 0.0   |
|   |    |                                    | 0.0   | 0.0   | 0.0   | 609.6  | 1043.1 | 1007.6 | 969.9  | 0.0    | 0.0   | 0.0   |
| 43  | 9  | VAPOR SOLDERING                    | 0.0   | 0.0   | 60.0  | 50.0   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0   | 0.0   |
|   |    |                                    | 0.0   | 0.0   | 0.0   | 609.6  | 1043.1 | 1007.6 | 969.9  | 0.0    | 0.0   | 0.0   |
| 44  | 1  | PCB METAL CORE                     | 0.0   | 0.0   | 85.0  | 100.0  | 0.0    | 0.0    | 0.0    | 0.0    | 0.0   | 0.0   |
|   |    |                                    | 0.0   | 0.0   | 0.0   | 585.2  | 1001.4 | 967.3  | 931.1  | 0.0    | 0.0   | 0.0   |
| 45  | 57 | N/C CBL HARNSS A809                | 0.0   | 0.0   | 200.0 | 500.0  | 200.0  | 0.0    | 0.0    | 0.0    | 0.0   | 0.0   |
|   |    |                                    | 0.0   | 0.0   | 0.0   | 0.0    | 698.5  | 1270.1 | 1154.6 | 1049.6 | 0.0   | 0.0   |
| 46  | 45 | AUTO STD MACH PROC88               | 0.0   | 0.0   | 250.0 | 250.0  | 0.0    | 0.0    | 0.0    | 0.0    | 0.0   | 0.0   |
|   |    |                                    | 0.0   | 0.0   | 0.0   | 614.7  | 1117.7 | 1016.1 | 923.7  | 0.0    | 0.0   | 0.0   |
| 47  | 10 | INTERACTIVE TESTING                | 0.0   | 0.0   | 50.0  | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0   | 0.0   |
|   |    |                                    | 0.0   | 0.0   | 599.5 | 975.3  | 834.5  | 806.1  | 0.0    | 0.0    | 0.0   | 0.0   |
| 48  | 27 | PCB DRILLING A833                  | 0.0   | 0.0   | 80.0  | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0   | 0.0   |
|   |    |                                    | 0.0   | 0.0   | 510.3 | 881.9  | 780.9  | 728.8  | 0.0    | 0.0    | 0.0   | 0.0   |
| 49  | 63 | MDS RAD MRD TST 4231               | 0.0   | 0.0   | 200.0 | 100.0  | 0.0    | 0.0    | 0.0    | 0.0    | 0.0   | 0.0   |
|   |    |                                    | 0.0   | 0.0   | 0.0   | 522.5  | 950.0  | 863.6  | 785.1  | 0.0    | 0.0   | 0.0   |
| 50  | 8  | RENORK STD HYB CIR                 | 0.0   | 0.0   | 200.0 | 200.0  | 200.0  | 0.0    | 0.0    | 0.0    | 0.0   | 0.0   |
|   |    |                                    | 0.0   | 0.0   | 0.0   | 609.6  | 782.4  | 1007.6 | 969.9  | 0.0    | 0.0   | 0.0   |
| 51  | 81 | STD.AUTOM.INTERFACES               | 0.0   | 0.0   | 50.0  | 50.0   | 50.0   | 0.0    | 0.0    | 0.0    | 0.0   | 0.0   |
|   |    |                                    | 0.0   | 0.0   | 0.0   | 461.0  | 838.2  | 762.0  | 692.8  | 0.0    | 0.0   | 0.0   |
| 52  | 67 | N/C CALIBRATION                    | 0.0   | 0.0   | 30.0  | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0   | 0.0   |
|   |    |                                    | 0.0   | 0.0   | 0.0   | 731.5  | 625.9  | 604.6  | 581.9  | 0.0    | 0.0   | 0.0   |
| 53  | 76 | CAD WIRE HARNSS-SFTWR              | 0.0   | 0.0   | 120.0 | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0   | 0.0   |
|   |    |                                    | 0.0   | 0.0   | 449.7 | 731.5  | 625.9  | 604.6  | 0.0    | 0.0    | 0.0   | 0.0   |
| 54  | 6  | PCB COMPUTER PLATING               | 0.0   | 0.0   | 70.0  | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0   | 0.0   |
|   |    |                                    | 0.0   | 0.0   | 0.0   | 390.1  | 667.6  | 644.9  | 620.7  | 0.0    | 0.0   | 0.0   |

|           |          | NAVY MANUFACTURING TECHNOLOGY FIVE YEAR PROGRAM |       |       |       |       |       |       |       |       |       |       |     |     |  |
|-----------|----------|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----|-----|--|
|           |          | PROJECT COST (\$,THOUSANDS)                     |       |       |       |       |       |       |       |       |       |       |     |     |  |
|           |          | ANTICIPATED SAVINGS (\$,THOUSANDS)              |       |       |       |       |       |       |       |       |       |       |     |     |  |
| PRIOR NO. | PROJ NO. | PROJECT TITLE                                   | FY 78 | FY 79 | FY 80 | FY 81 | FY 82 | FY 83 | FY 84 | FY 85 | FY 86 | FY 87 |     |     |  |
| 53        | 76       | CAD WIRE MANS-SFTMR                             | 0.0   | 0.0   | 120.0 | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0 | 0.0 |  |
|           |          |   | 0.0   | 0.0   | 449.7 | 731.5 | 625.9 | 604.6 |       |       |       |       |     |     |  |
| 54        | 6        | PCB COMPUTER PLATING                            | 0.0   | 0.0   | 70.0  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0 | 0.0 |  |
|           |          |   | 0.0   | 0.0   | 0.0   | 390.1 | 667.6 | 644.9 | 620.7 |       |       |       |     |     |  |
| 55        | 47       | FLATWIREINERCONNECT                             | 0.0   | 0.0   | 75.0  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0 | 0.0 |  |
|           |          |   | 0.0   | 0.0   | 0.0   | 384.2 | 608.5 | 635.0 | 577.3 | 0.0   | 0.0   | 0.0   | 0.0 | 0.0 |  |
| 56        | 40       | POLYIMIDE MLB A743                              | 0.0   | 0.0   | 200.0 | 50.0  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0 | 0.0 |  |
|           |          |   | 0.0   | 0.0   | 0.0   | 390.1 | 667.6 | 644.9 | 620.7 | 0.0   | 0.0   | 0.0   | 0.0 | 0.0 |  |
| 57        | 103      | JMK JET WIR MK A332                             | 0.0   | 0.0   | 400.0 | 400.0 | 200.0 | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0 | 0.0 |  |
|           |          |   | 0.0   | 0.0   | 0.0   | 0.0   | 372.6 | 952.5 | 846.7 | 769.7 | 0.0   | 0.0   | 0.0 | 0.0 |  |
| 58        | 99       | LASR INSP MYBD CIR.                             | 0.0   | 0.0   | 150.0 | 150.0 | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0 | 0.0 |  |
|           |          |   | 0.0   | 0.0   | 0.0   | 307.4 | 698.5 | 635.0 | 577.3 | 0.0   | 0.0   | 0.0   | 0.0 | 0.0 |  |
| 59        | 62       | IMPROVDMALOGCIRAS21                             | 0.0   | 0.0   | 60.0  | 40.0  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0 | 0.0 |  |
|           |          |   | 0.0   | 0.0   | 0.0   | 307.4 | 558.8 | 508.0 | 461.8 | 0.0   | 0.0   | 0.0   | 0.0 | 0.0 |  |
| 60        | 41       | AUTOMATED TMT 603A                              | 0.0   | 0.0   | 150.0 | 225.0 | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0 | 0.0 |  |
|           |          |   | 0.0   | 0.0   | 0.0   | 0.0   | 349.3 | 635.0 | 577.3 | 524.8 | 0.0   | 0.0   | 0.0 | 0.0 |  |
| 61        | 64       | AUTO PCB TST EQ A265                            | 0.0   | 0.0   | 150.0 | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0 | 0.0 |  |
|           |          |   | 0.0   | 0.0   | 0.0   | 307.4 | 558.8 | 508.0 | 461.8 | 0.0   | 0.0   | 0.0   | 0.0 | 0.0 |  |
| 62        | 7        | GANG PROBE MYB TEST                             | 0.0   | 0.0   | 20.0  | 20.0  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0 | 0.0 |  |
|           |          |   | 0.0   | 0.0   | 0.0   | 268.2 | 459.0 | 443.3 | 426.7 | 0.0   | 0.0   | 0.0   | 0.0 | 0.0 |  |
| 63        | 20       | RF PACKG TECH DNE027                            | 0.0   | 0.0   | 95.0  | 45.0  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0 | 0.0 |  |
|           |          |   | 0.0   | 0.0   | 0.0   | 307.4 | 489.0 | 444.5 | 404.1 | 0.0   | 0.0   | 0.0   | 0.0 | 0.0 |  |
| 64        | 94       | VAC LOCK CTNG A332                              | 0.0   | 0.0   | 200.0 | 150.0 | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0 | 0.0 |  |
|           |          |   | 0.0   | 0.0   | 0.0   | 304.8 | 521.6 | 503.8 | 484.9 | 0.0   | 0.0   | 0.0   | 0.0 | 0.0 |  |
| 65        | 19       | HYBRID LID DEV DNA2                             | 0.0   | 0.0   | 55.0  | 85.0  | 55.0  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0 | 0.0 |  |
|           |          |   | 0.0   | 0.0   | 0.0   | 0.0   | 231.0 | 476.3 | 427.2 | 388.4 | 0.0   | 0.0   | 0.0 | 0.0 |  |
| 66        | 88       | III V CMPND CRYST GR                            | 0.0   | 0.0   | 250.0 | 250.0 | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0 | 0.0 |  |
|           |          |   | 0.0   | 0.0   | 0.0   | 261.3 | 475.0 | 431.8 | 392.6 | 0.0   | 0.0   | 0.0   | 0.0 | 0.0 |  |
| 67        | 46       | AUTOPCBCOMPINSERT                               | 0.0   | 0.0   | 50.0  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0 | 0.0 |  |
|           |          |   | 0.0   | 0.0   | 0.0   | 184.4 | 335.3 | 304.8 | 277.1 | 0.0   | 0.0   | 0.0   | 0.0 | 0.0 |  |
| 68        | 100      | PONLTH CERAMIC CAP.                             | 0.0   | 0.0   | 80.0  | 190.0 | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0 | 0.0 |  |
|           |          |   | 0.0   | 0.0   | 0.0   | 205.9 | 335.3 | 304.8 | 277.1 | 0.0   | 0.0   | 0.0   | 0.0 | 0.0 |  |
| 69        | 31       | LOW COST CAPACT A503                            | 0.0   | 0.0   | 100.0 | 50.0  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0 | 0.0 |  |
|           |          |   | 0.0   | 0.0   | 0.0   | 0.0   | 167.6 | 304.8 | 277.1 | 251.9 | 0.0   | 0.0   | 0.0 | 0.0 |  |
| 70        | 2        | PCB CONFORM COATING                             | 0.0   | 0.0   | 115.0 | 100.0 | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0 | 0.0 |  |
|           |          |   | 0.0   | 0.0   | 0.0   | 0.0   | 166.9 | 322.4 | 310.4 | 250.8 | 0.0   | 0.0   | 0.0 | 0.0 |  |
| 71        | 22       | EBB DEVICES DNE042                              | 0.0   | 0.0   | 280.0 | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0 | 0.0 |  |
|           |          |   | 0.0   | 0.0   | 270.5 | 245.9 | 223.5 | 203.2 | 0.0   | 0.0   | 0.0   | 0.0   | 0.0 | 0.0 |  |
| 72        | 34       | POLY-SIL COAT A6308                             | 0.0   | 0.0   | 100.0 | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0 | 0.0 |  |
|           |          |   | 0.0   | 0.0   | 0.0   | 122.9 | 223.5 | 203.2 | 184.7 | 0.0   | 0.0   | 0.0   | 0.0 | 0.0 |  |

# NAVY MANUFACTURING TECHNOLOGY FIVE YEAR PROGRAM

| PRIOR NO. | PROJECT TITLE           | FY 78 | FY 79 | FY 80 | FY 81 | FY 82 | FY 83 | FY 84 | FY 85 | FY 86 | FY 87 |
|-----------|-------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 71        | 22 E83 DEVICES ONE042   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 72        | 34 POLY-SIL COAT A6308  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 73        | 82 MICRARCH. CONTROL    | 0.0   | 0.0   | 0.0   | 50.0  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 74        | 33 GARS FET A6218       | 0.0   | 0.0   | 0.0   | 250.0 | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 75        | 71 PROJECTION LITH SAW  | 0.0   | 0.0   | 0.0   | 60.0  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 76        | 37 MICROCHANNEL PL A324 | 0.0   | 0.0   | 0.0   | 250.0 | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 77        | 39 MNDS MEMORY A1298    | 0.0   | 0.0   | 0.0   | 200.0 | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 78        | 83 TACTILE SENSORS      | 0.0   | 0.0   | 0.0   | 150.0 | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 79        | 95 AUTO PHOTO CATHA322  | 0.0   | 0.0   | 0.0   | 200.0 | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 80        | 18 SAN REPLICATN DN4508 | 0.0   | 0.0   | 0.0   | 250.0 | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 81        | 38 GA-AS ICSMICROWA1218 | 0.0   | 0.0   | 0.0   | 500.0 | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 82        | 90 EP YIG FILT A508     | 0.0   | 0.0   | 0.0   | 250.0 | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 83        | 89 GARS FET YL IM A6188 | 0.0   | 0.0   | 0.0   | 650.0 | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |

PROJECT COST (\$,THOUSANDS)  
ANTICIPATED SAVINGS (\$,THOUSANDS)

| PRIOR NO. | PROJECT TITLE           | FY 78 | FY 79 | FY 80 | FY 81 | FY 82 | FY 83 | FY 84 | FY 85 | FY 86 | FY 87 |
|-----------|-------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 71        | 22 E83 DEVICES ONE042   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 72        | 34 POLY-SIL COAT A6308  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 73        | 82 MICRARCH. CONTROL    | 0.0   | 0.0   | 0.0   | 50.0  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 74        | 33 GARS FET A6218       | 0.0   | 0.0   | 0.0   | 250.0 | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 75        | 71 PROJECTION LITH SAW  | 0.0   | 0.0   | 0.0   | 60.0  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 76        | 37 MICROCHANNEL PL A324 | 0.0   | 0.0   | 0.0   | 250.0 | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 77        | 39 MNDS MEMORY A1298    | 0.0   | 0.0   | 0.0   | 200.0 | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 78        | 83 TACTILE SENSORS      | 0.0   | 0.0   | 0.0   | 150.0 | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 79        | 95 AUTO PHOTO CATHA322  | 0.0   | 0.0   | 0.0   | 200.0 | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 80        | 18 SAN REPLICATN DN4508 | 0.0   | 0.0   | 0.0   | 250.0 | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 81        | 38 GA-AS ICSMICROWA1218 | 0.0   | 0.0   | 0.0   | 500.0 | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 82        | 90 EP YIG FILT A508     | 0.0   | 0.0   | 0.0   | 250.0 | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 83        | 89 GARS FET YL IM A6188 | 0.0   | 0.0   | 0.0   | 650.0 | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |



## SUMMARY

SAMPLE MANUFACTURING TECHNOLOGY PROJECTS ORDERED BY HIGHEST NET GAIN

| Prior | PROJECT IDENTIFICATION<br>NUMBER AND TITLE | PROJECT COST<br>(\$ THOUSANDS) | NET GAIN (\$ THOUSANDS)<br>(UPPER) | NET GAIN (\$ THOUSANDS)<br>(LOWER) | CUM. PROJ. COST<br>(\$ THOUSANDS) | S/I   |
|-------|--|--------------------------------|------------------------------------|------------------------------------|-----------------------------------|-------|
| 1     | 12 AUTO FAULT ISOLATION                    | 200.0                          | 67962.1                            | 50921.5                            | 200.0                             | 340.8 |
| 2     | 59 PCB OCR INSP. A266                      | 800.0                          | 56500.9                            | 45040.7                            | 1000.0                            | 71.6  |
| 3     | 61 TEST OPTM MODEL A213                    | 350.0                          | 53004.9                            | 39666.1                            | 1350.0                            | 152.4 |
| 4     | 85 FBR-OPT INT STR A311                    | 500.0                          | 47705.0                            | 23602.5                            | 1850.0                            | 96.4  |
| 5     | 32 FIB OPT SIG CBL A314                    | 650.0                          | 45447.2                            | 36227.7                            | 2500.0                            | 70.9  |
| 6     | 52 ELEC CONNECPLATEA502                    | 350.0                          | 35227.8                            | 26333.4                            | 2850.0                            | 101.7 |
| 7     | 50 AUTO WIRE SYS                           | 2500.0                         | 29149.8                            | 19654.9                            | 5350.0                            | 12.7  |
| 8     | 84 RE-EMRODIMENT LSI                       | 950.0                          | 27425.4                            | 24587.8                            | 6300.0                            | 29.9  |
| 9     | 87 PLAS MV CARB A773                       | 300.0                          | 22650.7                            | 20355.6                            | 6600.0                            | 76.5  |
| 10    | 23 THINSLAYRTEC DNAS66                     | 1100.0                         | 19414.1                            | 12965.4                            | 7700.0                            | 18.7  |
| 11    | 101 CL.CR.CL.PCB AA47                      | 95.0                           | 18544.6                            | 16002.6                            | 7795.0                            | 196.6 |
| 12    | 80 QK REACTION CNG.CAP.                    | 2100.0                         | 18116.4                            | 8008.2                             | 9895.0                            | 9.6   |
| 13    | 4 SOLDER SPC.IPLCE                         | 700.0                          | 17982.3                            | 14109.3                            | 10595.0                           | 26.7  |
| 14    | 3 GROUP TECH/PARTS CLS                     | 750.0                          | 17191.8                            | 8220.9                             | 11345.0                           | 23.9  |
| 15    | 66 CMOS CUSTOM LTH A124                    | 750.0                          | 15812.7                            | 14156.4                            | 12095.0                           | 22.1  |
| 16    | 86 GLUE AV-CHASIS AA02                     | 100.0                          | 15027.2                            | 13514.5                            | 12195.0                           | 151.3 |
| 17    | 43 LSHYPRID ASSY A116A                     | 300.0                          | 14758.7                            | 10241.1                            | 12495.0                           | 50.2  |
| 18    | 54 WATERSOLFUXSOL A862                     | 450.0                          | 12355.2                            | 10151.4                            | 12945.0                           | 28.5  |
| 19    | 65 RIBRON SAPPHIRE                         | 750.0                          | 12147.9                            | 5699.0                             | 13695.0                           | 17.2  |
| 20    | 70 LASER WELDING CARINT                    | 500.0                          | 10630.7                            | 7291.5                             | 14195.0                           | 22.3  |
| 21    | 30 SUB AU PN PLATE A501                    | 150.0                          | 10282.1                            | 7674.1                             | 14345.0                           | 69.6  |
| 22    | 24 ION IMPLANTION DNA44                    | 580.0                          | 9674.6                             | 6598.2                             | 14925.0                           | 17.7  |
| 23    | 53 MECH FLEXRG PCH A840                    | 550.0                          | 9316.7                             | 6356.7                             | 15475.0                           | 17.9  |
| 24    | 35 ULTRATHIN MICRO A72                     | 380.0                          | 8690.3                             | 3248.1                             | 15855.0                           | 23.9  |
| 25    | 16 HYBRD LAS BND DNAS79                    | 400.0                          | 8138.7                             | 3869.3                             | 16255.0                           | 21.4  |
| 26    | 17 IONRESISTTRIM DNAS77                    | 430.0                          | 8108.7                             | 5974.0                             | 16685.0                           | 19.9  |
| 27    | 51 COMP SHOP INSTRUCT                      | 200.0                          | 7837.8                             | 5426.5                             | 16885.0                           | 40.2  |
| 28    | 98 CMOS/SOS MANU A125B                     | 600.0                          | 7464.5                             | 5448.4                             | 17485.0                           | 13.4  |
| 29    | 13 AUTO-HYB ASMBLY                         | 620.0                          | 6990.3                             | 3185.1                             | 18105.0                           | 12.3  |
| 30    | 21 EL BM LSI CIR DNA415                    | 600.0                          | 6493.8                             | 2946.9                             | 18705.0                           | 11.8  |
| 31    | 102 OP.ASST.ASSEMBL AA05                   | 70.0                           | 5989.0                             | 4474.2                             | 18775.0                           | 86.6  |
| 32    | 5 PCB SMEAR FREE HOLES                     | 150.0                          | 5658.3                             | 3335.0                             | 18925.0                           | 38.7  |
| 33    | 77 AV.NC MACH CONTROL                      | 400.0                          | 5408.3                             | 3956.2                             | 19325.0                           | 14.5  |
| 34    | 69 PLASTIC MICROWV COMP                    | 140.0                          | 5305.3                             | 4760.8                             | 19465.0                           | 38.9  |
| 35    | 72 TECH SM.COURSE                          | 1600.0                         | 5300.1                             | 1850.0                             | 21065.0                           | 4.3   |
| 36    | 26 PCB ELICHEM ETCH A832                   | 96.0                           | 5194.0                             | 3871.5                             | 21161.0                           | 55.1  |
| 37    | 36 LIGHTMT RF STRIPLINE                    | 120.0                          | 4929.1                             | 3666.9                             | 21281.0                           | 42.1  |
| 38    | 11 DATA LNK-SUPPLR/ASMB                    | 50.0                           | 4882.2                             | 3649.1                             | 21331.0                           | 98.6  |
| 39    | 79 SLK SCRIN PRNTNG PCB5                   | 150.0                          | 4697.2                             | 3485.4                             | 21481.0                           | 32.3  |
| 40    | 55 SMEARFREEPCB A836                       | 250.0                          | 4156.5                             | 3054.9                             | 21731.0                           | 17.6  |
| 41    | 56 AUTOCBLEHARNES A330                     | 550.0                          | 3622.9                             | 2579.6                             | 22281.0                           | 7.6   |
| 42    | 68 HYBRID SEAL RINGS                       | 70.0                           | 3560.2                             | 2834.2                             | 22351.0                           | 51.9  |
| 43    | 9 VAPOR SOLDERING                          | 110.0                          | 3520.2                             | 3157.2                             | 22461.0                           | 33.0  |
| 44    | 1 PCB METAL CORE                           | 185.0                          | 3300.0                             | 1906.0                             | 22646.0                           | 18.8  |
| 45    | 57 N/C CBL HARNES A809                     | 900.0                          | 3272.9                             | 2229.6                             | 23546.0                           | 4.6   |
| 46    | 45 AUTO STD MACH PROCSS                    | 500.0                          | 3172.1                             | 2804.9                             | 24046.0                           | 7.3   |
| 47    | 10 INTERACTIVE TESTING                     | 50.0                           | 3165.5                             | 2200.8                             | 24096.0                           | 64.3  |
| 48    | 27 PCB DRILLING A833                       | 80.0                           | 2821.9                             | 1661.2                             | 24176.0                           | 36.3  |
| 49    | 63 MOS RAD MRD TST A231                    | 300.0                          | 2821.3                             | 2353.1                             | 24476.0                           | 10.4  |
| 50    | 8 REWORK STD HYB CIR                       | 600.0                          | 2769.4                             | 1927.1                             | 25076.0                           | 5.6   |
| 51    | 81 STD.AUTOM.INTERFACES                    | 150.0                          | 2604.1                             | 2328.7                             | 25226.0                           | 18.4  |
| 52    | 67 N/C CALIBRATION                         | 30.0                           | 2513.9                             | 2005.1                             | 25256.0                           | 84.8  |
| 53    | 76 CAD WIRE HRNSS-SFTWR                    | 120.0                          | 2291.6                             | 1688.7                             | 25376.0                           | 20.1  |
| 54    | 6 PCB COMPUTER PLATING                     | 70.0                           | 2253.3                             | 1324.0                             | 25446.0                           | 33.2  |
| 55    | 47 FLATWIREINERCONNECT                     | 75.0                           | 2220.1                             | 1646.3                             | 25521.0                           | 30.6  |
| 56    | 40 POLYIMIDE MLB A743                      | 250.0                          | 2073.3                             | 1492.5                             | 25771.0                           | 9.3   |
| 57    | 103 JNK JET WIR MK ASS2                    | 1000.0                         | 1941.6                             | 1206.2                             | 26771.0                           | 2.9   |
| 58    | 99 LASR INSP HYBD CIR.                     | 300.0                          | 1918.2                             | 1650.3                             | 27071.0                           | 7.4   |
| 59    | 62 IMPROVDANALOGCIRA251                    | 100.0                          | 1736.1                             | 1001.6                             | 27171.0                           | 18.4  |
| 60    | 41 AUTOMATED TWT 603A                      | 375.0                          | 1711.4                             | 1085.5                             | 27546.0                           | 5.6   |
| 61    | 64 AUTO PCR TST EQ A265                    | 150.0                          | 1686.1                             | 768.0                              | 27696.0                           | 12.2  |
| 62    | 7 GANG PROBE HYB TEST                      | 40.0                           | 1557.3                             | 1317.7                             | 27736.0                           | 39.9  |
| 63    | 20 RF PACKG TECH DNE027                    | 140.0                          | 1505.0                             | 1011.5                             | 27876.0                           | 11.8  |
| 64    | 94 VAC LOCK CTNG A332                      | 350.0                          | 1465.1                             | 1237.9                             | 28226.0                           | 5.2   |
| 65    | 19 HYBRID LID DEV DNA2                     | 195.0                          | 1327.8                             | 566.4                              | 28421.0                           | 7.8   |
| 66    | 88 III V CMPND CRYST GR                    | 500.0                          | 1060.6                             | 280.3                              | 28921.0                           | 3.1   |
| 67    | 26 AUTOPCBCOMPINSRT                        | 50.0                           | 1051.6                             | 941.5                              | 28971.0                           | 22.0  |
| 68    | 100 MONTH CERAMIC CAP.                     | 270.0                          | 893.1                              | 739.9                              | 29241.0                           | 4.3   |
| 69    | 31 LOW COST CAPACT A503                    | 150.0                          | 851.5                              | 651.2                              | 29391.0                           | 6.7   |
| 70    | 2 PCB CONFORM COATING                      | 215.0                          | 835.5                              | 608.7                              | 29606.0                           | 4.9   |
| 71    | 22 EBS DEVICES DNE042                      | 280.0                          | 663.1                              | 2.9                                | 29886.0                           | 3.4   |
| 72    | 34 POLY-SIL COAT A430B                     | 100.0                          | 634.4                              | 340.7                              | 29986.0                           | 7.3   |
| 73    | 82 HIERARCH.CONTROL                        | 100.0                          | 450.8                              | 395.7                              | 30086.0                           | 5.5   |
| 74    | 33 GAAS FET A421B                          | 500.0                          | 274.4                              | 45.6                               | 30586.0                           | 1.6   |
| 75    | 71 PROJECTION LITH SAN                     | 120.0                          | 72.3                               | 25.0                               | 30706.0                           | 1.6   |
| 76    | 37 MICROCHANNEL PL A124                    | 250.0                          | 17.9                               | -62.5                              | 30956.0                           | 1.1   |
| 77    | 39 MNC5 MEMORY A129H                       | 400.0                          | 1.9                                | -78.5                              | 31356.0                           | 1.0   |
| 78    | 83 TACTILE SENSORS                         | 550.0                          | -49.3                              | -299.6                             | 31406.0                           | .9    |
| 79    | 45 AUTO PHOTO CATHA322                     | 350.0                          | -82.1                              | -120.4                             | 32256.0                           | .8    |
| 80    | 18 SAW REPLICATN DNAS08                    | 250.0                          | -176.6                             | -213.3                             | 32506.0                           | .3    |
| 81    | 38 GA-AS ICSMICROWA121B                    | 1000.0                         | -220.6                             | -376.5                             | 33506.0                           | .8    |
| 82    | 90 FP YIG FILT A508                        | 400.0                          | -232.8                             | -416.4                             | 34106.0                           | .6    |
| 83    | 89 GAAS FET YL IM A418B                    | 1300.0                         | -442.6                             | -871.3                             | 35406.0                           | .7    |

TABLE 3

Table 3

----- MANUFACTURING TECHNOLOGY STUDY --- 06/07/77 -----

## Product Cost Category - 1 CABNTS.CABLS.INTRCON

PROJECT COSTS (\$,THOUSANDS)  
ANTICIPATED SAVINGS (\$,THOUSANDS) - UPPER BOUND  
LOWER BOUND  
(ALL FIGURES IN FY 70 DOLLARS)

| PROJ<br>NO. | PROJECT TITLE        | FY 76 | FY 79 | FY 80 | FY 81  | FY 82  | FY 83  | FY 84  | FY 85  | FY 86 | FY 87 | TOTAL  | S/I  | Y   |
|-------------|----------------------|-------|-------|-------|--------|--------|--------|--------|--------|-------|-------|--------|------|-----|
| 86          | GLUE AV-CHASIS A802  | 0.    | 0.    | 100.  | 0.     | 0.     | 0.     | 0.     | 0.     | 0.    | 0.    | 100.   | 151. | 3 1 |
|             |                      | 0.    | 0.    | 2029. | 4610.  | 3726.  | 4763.  |        |        |       |       | 15127. | 136. |     |
|             |                      | 0.    | 0.    | 1826. | 4149.  | 3353.  | 4287.  |        |        |       |       | 13615. |      |     |
| 52          | ELEC CONNECPLATEA502 | 0.    | 0.    | 150.  | 200.   | 0.     | 0.     | 0.     | 0.     | 0.    | 0.    | 350.   | 102. | 3 0 |
|             |                      | 0.    | 0.    | 5750. | 0.     | 9826.  | 10457. | 9545.  |        |       |       | 35578. | 76.  |     |
|             |                      | 0.    | 0.    | 4313. | 7370.  | 7843.  | 7159.  |        |        |       |       | 26683. |      |     |
| 85          | FBR-OPT INT STR A311 | 0.    | 0.    | 250.  | 250.   | 0.     | 0.     | 0.     | 0.     | 0.    | 0.    | 500.   | 96.  | 3 0 |
|             |                      | 0.    | 0.    | 7658. | 12667. | 14563. | 13317. | 48205. |        |       |       | 24103. | 48.  |     |
|             |                      | 0.    | 0.    | 3829. | 6333.  | 7282.  | 6658.  |        |        |       |       |        |      |     |
| 87          | PLAS HV CABLS A773   | 0.    | 0.    | 150.  | 150.   | 0.     | 0.     | 0.     | 0.     | 0.    | 0.    | 300.   | 77.  | 3 0 |
|             |                      | 0.    | 0.    | 3842. | 6985.  | 6350.  | 5773.  | 22951. |        |       |       | 20656. | 69.  |     |
|             |                      | 0.    | 0.    | 3458. | 6287.  | 5715.  | 5196.  |        |        |       |       |        |      |     |
| 32          | FIB OPT SIG CBL A314 | 0.    | 0.    | 250.  | 250.   | 150.   | 0.     | 0.     | 0.     | 0.    | 0.    | 650.   | 71.  | 1 0 |
|             |                      | 0.    | 0.    | 0.    | 0.     | 7938.  | 14240. | 12946. | 10974. |       |       | 46097. | 57.  |     |
|             |                      | 0.    | 0.    | 0.    | 0.     | 0.     | 6350.  | 11392. | 10357. | 8779. |       | 36878. |      |     |
| 30          | SUB AU PN PLATE A501 | 0.    | 0.    | 100.  | 50.    | 0.     | 0.     | 0.     | 0.     | 0.    | 0.    | 150.   | 70.  | 3 0 |
|             |                      | 0.    | 0.    | 0.    | 0.     | 1746.  | 3175.  | 2887.  | 2624.  |       |       | 10432. | 52.  |     |
|             |                      | 0.    | 0.    | 0.    | 0.     | 1310.  | 2381.  | 2165.  | 1968.  |       |       | 7824.  |      |     |
| 36          | LIGHTWT RF STRIPLINE | 0.    | 0.    | 120.  | 0.     | 0.     | 0.     | 0.     | 0.     | 0.    | 0.    | 120.   | 42.  | 3 0 |
|             |                      | 0.    | 0.    | 845.  | 1537.  | 1397.  | 1270.  |        |        |       |       | 5419.  | 32.  |     |
|             |                      | 0.    | 0.    | 634.  | 1153.  | 1048.  | 953.   |        |        |       |       | 3787.  |      |     |
| 9           | VAPOR SOLDERING      | 0.    | 0.    | 60.   | 50.    | 0.     | 0.     | 0.     | 0.     | 0.    | 0.    | 110.   | 33.  | 2 3 |
|             |                      | 0.    | 0.    | 0.    | 610.   | 1043.  | 1008.  | 970.   |        |       |       | 3630.  | 30.  |     |
|             |                      | 0.    | 0.    | 0.    | 589.   | 939.   | 907.   | 873.   |        |       |       | 3267.  |      |     |
| 47          | FLATWIREINERCONNECT  | 0.    | 0.    | 75.   | 0.     | 0.     | 0.     | 0.     | 0.     | 0.    | 0.    | 75.    | 31.  | 3 0 |
|             |                      | 0.    | 0.    | 0.    | 384.   | 699.   | 635.   | 577.   |        |       |       | 2295.  | 23.  |     |
|             |                      | 0.    | 0.    | 0.    | 288.   | 524.   | 476.   | 433.   |        |       |       | 1721.  |      |     |
| 70          | LASER WELDING CABINT | 0.    | 0.    | 300.  | 200.   | 0.     | 0.     | 0.     | 0.     | 0.    | 0.    | 500.   | 22.  | 3 0 |
|             |                      | 0.    | 0.    | 0.    | 0.     | 2445.  | 3175.  | 2887.  | 2624.  |       |       | 11131. | 16.  |     |
|             |                      | 0.    | 0.    | 0.    | 0.     | 1711.  | 2223.  | 2021.  | 1837.  |       |       | 7792.  |      |     |
| 20          | RF PACKG TECH ONE027 | 0.    | 0.    | 45.   | 45.    | 0.     | 0.     | 0.     | 0.     | 0.    | 0.    | 140.   | 12.  | 3 0 |
|             |                      | 0.    | 0.    | 0.    | 307.   | 489.   | 445.   | 404.   |        |       |       | 1645.  | 8.   |     |
|             |                      | 0.    | 0.    | 0.    | 215.   | 342.   | 311.   | 283.   |        |       |       | 1152.  |      |     |
| 56          | AUTOCABLEHARNES A330 | 0.    | 0.    | 350.  | 200.   | 0.     | 0.     | 0.     | 0.     | 0.    | 0.    | 550.   | 8.   | 2 3 |
|             |                      | 0.    | 0.    | 0.    | 0.     | 699.   | 1270.  | 1155.  | 1050.  |       |       | 4173.  | 6.   |     |
|             |                      | 0.    | 0.    | 0.    | 0.     | 524.   | 953.   | 866.   | 787.   |       |       | 3130.  |      |     |
| 57          | N/C CBL HARNES A809  | 0.    | 0.    | 200.  | 500.   | 200.   | 0.     | 0.     | 0.     | 0.    | 0.    | 900.   | 5.   | 2 3 |
|             |                      | 0.    | 0.    | 0.    | 0.     | 699.   | 1270.  | 1155.  | 1050.  |       |       | 4173.  |      |     |



56 AUTOCOLEHARNES A930

57 N/C CBL HARNESS A809

103 JNK JET WIR MK A992

|                  |  |
|------------------|--|
| INVESTMENT TOTAL |  |
| SAVINGS TOTAL(U) |  |
| SAVINGS TOTAL(L) |  |

SCIENCE APPLICATIONS, INC. MCLEAN, VA. ----

MANUFACTURING TECHNOLOGY STUDY 06/07/77

## ELEMENT - 2 SNRS.ANTNNA.SP.TBS

PROJECT COSTS (\$,THOUSANDS)  
 ANTICIPATED SAVINGS (\$,THOUSANDS) - UPPER BOUND  
 LOWER BOUND  
 (ALL FIGURES IN FY 78 DOLLARS)

| PROJ<br>NO. | PROJECT TITLE        | FY 78 | FY 79 | FY 80 | FY 81 | FY 82 | FY 83 | FY 84 | FY 85 | FY 86 | FY 87 | TOTAL | S/I | Y   |
|-------------|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----|-----|
| 69          | PLASTIC MICRONV COMP | 0.    | 0.    | 140.  | 0.    | 0.    | 0.    | 0.    | 0.    | 0.    | 0.    | 140.  | 39. | 3 0 |
|             |                      | 0.    | 0.    | 0.    | 914.  | 1565. | 1511. | 1455. | 0.    | 0.    | 0.    | 5445. | 35. |     |
|             |                      | 0.    | 0.    | 0.    | 823.  | 1408. | 1360. | 1309. | 0.    | 0.    | 0.    | 4901. |     |     |
| 41          | AUTOMATED TMT 603A   | 0.    | 0.    | 150.  | 225.  | 0.    | 0.    | 0.    | 0.    | 0.    | 0.    | 375.  | 6.  | 1 0 |
|             |                      | 0.    | 0.    | 0.    | 0.    | 349.  | 635.  | 577.  | 525.  | 0.    | 0.    | 2086. | 4.  |     |
|             |                      | 0.    | 0.    | 0.    | 0.    | 245.  | 445.  | 404.  | 367.  | 0.    | 0.    | 1461. |     |     |
| 94          | VAC LOCK CTNG A332   | 0.    | 0.    | 200.  | 150.  | 0.    | 0.    | 0.    | 0.    | 0.    | 0.    | 350.  | 5.  | 1 2 |
|             |                      | 0.    | 0.    | 0.    | 305.  | 522.  | 504.  | 485.  | 0.    | 0.    | 0.    | 1815. | 5.  |     |
|             |                      | 0.    | 0.    | 0.    | 229.  | 469.  | 453.  | 436.  | 0.    | 0.    | 0.    | 1588. |     |     |
| 37          | MICROCHANNEL PL A324 | 0.    | 0.    | 250.  | 0.    | 0.    | 0.    | 0.    | 0.    | 0.    | 0.    | 250.  | 1.  | 3 0 |
|             |                      | 0.    | 0.    | 0.    | 77.   | 70.   | 64.   | 58.   | 0.    | 0.    | 0.    | 268.  | 1.  |     |
|             |                      | 0.    | 0.    | 0.    | 54.   | 49.   | 45.   | 40.   | 0.    | 0.    | 0.    | 188.  |     |     |
| 95          | AUTO PHOTO CATHA322  | 0.    | 0.    | 200.  | 150.  | 0.    | 0.    | 0.    | 0.    | 0.    | 0.    | 350.  | 1.  | 3 0 |
|             |                      | 0.    | 0.    | 0.    | 77.   | 70.   | 64.   | 58.   | 0.    | 0.    | 0.    | 268.  | 1.  |     |
|             |                      | 0.    | 0.    | 0.    | 58.   | 63.   | 57.   | 52.   | 0.    | 0.    | 0.    | 230.  |     |     |
|             | INVESTMENT TOTAL     | 0.    | 0.    | 940.  | 525.  | 0.    | 0.    | 0.    | 0.    | 0.    | 0.    | 1465. | 7.  |     |
|             | SAVINGS TOTAL(U)     | 0.    | 0.    | 0.    | 1373. | 2575. | 2777. | 2632. | 525.  | 0.    | 0.    | 9843. | 6.  |     |
|             | SAVINGS TOTAL(L)     | 0.    | 0.    | 0.    | 1163. | 2234. | 2360. | 2242. | 367.  | 0.    | 0.    | 8366. |     |     |



----- MANUFACTURING TECHNOLOGY STUDY --- 06/07/77 -----

## ELEMENT - 3 INTEGRATED CIRCUITS

PROJECT COSTS (\$ THOUSANDS)  
ANTICIPATED SAVINGS (\$ THOUSANDS) - UPPER BOUND  
LOWER BOUND  
(ALL FIGURES IN FY 70 DOLLARS)

| PROJ<br>NO. | PROJECT TITLE        | FY 70 | FY 79 | FY 80 | FY 81 | FY 82  | FY 83  | FY 84  | FY 85  | FY 86 | FY 87 | TOTAL   | S/I | Y   |
|-------------|----------------------|-------|-------|-------|-------|--------|--------|--------|--------|-------|-------|---------|-----|-----|
| 84          | RE-EMBODIMENT LSI    | 0.    | 0.    | 200.  | 250.  | 500.   | 0.     | 0.     | 0.     | 0.    | 0.    | 950.    | 30. | 1 0 |
|             |                      | 0.    | 0.    | 0.    | 0.    | 4750.  | 8637.  | 7051.  | 7130.  | 0.    | 0.    | 28375.  | 27. |     |
|             |                      | 0.    | 0.    | 0.    | 0.    | 4275.  | 7773.  | 7066.  | 6424.  | 0.    | 0.    | 25538.  |     |     |
| 35          | ULTRATHIN PICROC A72 | 0.    | 0.    | 220.  | 160.  | 0.     | 0.     | 0.     | 0.     | 0.    | 0.    | 380.    | 24. | 1 3 |
|             |                      | 0.    | 0.    | 0.    | 0.    | 1336.  | 2044.  | 2596.  | 2294.  | 0.    | 0.    | 9070.   | 10. |     |
|             |                      | 0.    | 0.    | 0.    | 0.    | 535.   | 1130.  | 1039.  | 917.   | 0.    | 0.    | 3628.   |     |     |
| 66          | CMOS CUSTOM LIB A124 | 0.    | 0.    | 250.  | 250.  | 250.   | 0.     | 0.     | 0.     | 0.    | 0.    | 750.    | 22. | 1 0 |
|             |                      | 0.    | 0.    | 0.    | 0.    | 4750.  | 4310.  | 3926.  | 3569.  | 0.    | 0.    | 16563.  | 20. |     |
|             |                      | 0.    | 0.    | 0.    | 0.    | 4275.  | 3086.  | 3533.  | 3212.  | 0.    | 0.    | 14906.  |     |     |
| 23          | THINSLAYTEC DNAS66   | 0.    | 0.    | 550.  | 400.  | 150.   | 0.     | 0.     | 0.     | 0.    | 0.    | 1100.   | 19. | 3 0 |
|             |                      | 0.    | 0.    | 0.    | 0.    | 2945.  | 6477.  | 5810.  | 5282.  | 0.    | 0.    | 20514.  | 13. |     |
|             |                      | 0.    | 0.    | 0.    | 0.    | 1767.  | 4534.  | 4067.  | 3697.  | 0.    | 0.    | 14065.  |     |     |
| 24          | ION IMPLANTION DN44  | 0.    | 0.    | 230.  | 100.  | 250.   | 0.     | 0.     | 0.     | 0.    | 0.    | 580.    | 18. | 2 0 |
|             |                      | 0.    | 0.    | 0.    | 0.    | 1520.  | 3239.  | 2879.  | 2617.  | 0.    | 0.    | 10255.  | 12. |     |
|             |                      | 0.    | 0.    | 0.    | 0.    | 1064.  | 2267.  | 2015.  | 1832.  | 0.    | 0.    | 7170.   |     |     |
| 65          | RIBBON SAPPHIRE      | 0.    | 0.    | 250.  | 250.  | 250.   | 0.     | 0.     | 0.     | 0.    | 0.    | 750.    | 17. | 3 0 |
|             |                      | 0.    | 0.    | 0.    | 0.    | 0.     | 2159.  | 3926.  | 3569.  | 3244. | 0.    | 12898.  | 9.  |     |
|             |                      | 0.    | 0.    | 0.    | 0.    | 0.     | 1080.  | 1963.  | 1780.  | 1622. | 0.    | 6449.   |     |     |
| 98          | CMOS/SOS MANU A1258  | 0.    | 0.    | 300.  | 300.  | 0.     | 0.     | 0.     | 0.     | 0.    | 0.    | 600.    | 13. | 3 0 |
|             |                      | 0.    | 0.    | 0.    | 1568. | 2375.  | 2159.  | 1963.  | 0.     | 0.    | 0.    | 8064.   | 10. |     |
|             |                      | 0.    | 0.    | 0.    | 1176. | 1781.  | 1619.  | 1472.  | 0.     | 0.    | 0.    | 6048.   |     |     |
| 21          | EL 8M LSI CIR DN415  | 0.    | 0.    | 250.  | 150.  | 200.   | 0.     | 0.     | 0.     | 0.    | 0.    | 600.    | 12. | 2 0 |
|             |                      | 0.    | 0.    | 0.    | 0.    | 1188.  | 2159.  | 1963.  | 1780.  | 0.    | 0.    | 7094.   | 6.  |     |
|             |                      | 0.    | 0.    | 0.    | 0.    | 594.   | 1080.  | 981.   | 892.   | 0.    | 0.    | 3547.   |     |     |
| 63          | MOS RAD HRD TST A231 | 0.    | 0.    | 200.  | 100.  | 0.     | 0.     | 0.     | 0.     | 0.    | 0.    | 300.    | 10. | 4 0 |
|             |                      | 0.    | 0.    | 0.    | 523.  | 950.   | 864.   | 785.   | 0.     | 0.    | 0.    | 3121.   | 9.  |     |
|             |                      | 0.    | 0.    | 0.    | 444.  | 808.   | 734.   | 667.   | 0.     | 0.    | 0.    | 2653.   |     |     |
| 88          | III V CMPND CRYST GR | 0.    | 0.    | 250.  | 250.  | 0.     | 0.     | 0.     | 0.     | 0.    | 0.    | 500.    | 3.  | 3 0 |
|             |                      | 0.    | 0.    | 0.    | 261.  | 475.   | 432.   | 393.   | 0.     | 0.    | 0.    | 1561.   | 2.  |     |
|             |                      | 0.    | 0.    | 0.    | 131.  | 238.   | 216.   | 196.   | 0.     | 0.    | 0.    | 780.    |     |     |
| 39          | MNOS MEMORY A1298    | 0.    | 0.    | 200.  | 200.  | 0.     | 0.     | 0.     | 0.     | 0.    | 0.    | 400.    | 1.  | 3 0 |
|             |                      | 0.    | 0.    | 0.    | 0.    | 48.    | 130.   | 118.   | 107.   | 0.    | 0.    | 402.    | 1.  |     |
|             |                      | 0.    | 0.    | 0.    | 0.    | 38.    | 104.   | 94.    | 86.    | 0.    | 0.    | 322.    |     |     |
|             | INVESTMENT TOTAL     | 0.    | 0.    | 2900. | 2410. | 1600.  | 0.     | 0.     | 0.     | 0.    | 0.    | 6910.   | 17. |     |
|             | SAVINGS TOTAL(U)     | 0.    | 0.    | 0.    | 2351. | 20336. | 33417. | 32209. | 26350. | 3244. | 0.    | 117917. | 12. |     |
|             | SAVINGS TOTAL(L)     | 0.    | 0.    | 0.    | 1750. | 15374. | 24430. | 23094. | 18845. | 1622. | 0.    | 85115.  |     |     |

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| PROJ<br>NO. | PROJECT TITLE         | FY 78 | FY 79 | FY 80 | FY 81  | FY 82  | FY 83  | FY 84  | FY 85 | FY 86 | FY 87 | TOTAL  | S/I  | Y   |
|-------------|-----------------------|-------|-------|-------|--------|--------|--------|--------|-------|-------|-------|--------|------|-----|
| 101         | CL.CR.CL.PCB A847     | 0.    | 0.    | 95.   | 5410.  | 4620.  | 5080.  | 0.     | 0.    | 0.    | 0.    | 75.    | 197. | 3 0 |
|             |                       | 0.    | 0.    | 2499. | 4869.  | 4158.  | 4572.  |        |       |       |       | 16098. | 169. |     |
| 26          | PCB ELICHEM ETCH A832 | 0.    | 0.    | 96.   | 0.     | 1258.  | 1339.  | 1222.  | 0.    | 0.    | 0.    | 96.    | 55.  | 3 0 |
|             |                       | 0.    | 0.    | 0.    | 1472.  | 943.   | 1004.  | 916.   |       |       |       | 3968.  | 41.  |     |
| 5           | PCB SWEAR FREE HOLES  | 0.    | 0.    | 90.   | 60.    | 0.     | 0.     | 0.     | 0.    | 0.    | 0.    | 150.   | 39.  | 3 0 |
|             |                       | 0.    | 0.    | 0.    | 975.   | 1669.  | 1612.  | 1552.  |       |       |       | 5808.  | 23.  |     |
|             |                       | 0.    | 0.    | 0.    | 585.   | 1001.  | 967.   | 931.   |       |       |       | 3485.  |      |     |
| 27          | PCB DRILLING A833     | 0.    | 0.    | 80.   | 0.     | 0.     | 0.     | 0.     | 0.    | 0.    | 0.    | 80.    | 36.  | 3 0 |
|             |                       | 0.    | 0.    | 510.  | 862.   | 781.   | 729.   |        |       |       |       | 2902.  | 22.  |     |
|             |                       | 0.    | 0.    | 308.  | 529.   | 469.   | 437.   |        |       |       |       | 1741.  |      |     |
| 6           | PCB COMPUTER PLATING  | 0.    | 0.    | 70.   | 0.     | 0.     | 0.     | 0.     | 0.    | 0.    | 0.    | 70.    | 33.  | 3 0 |
|             |                       | 0.    | 0.    | 0.    | 390.   | 668.   | 645.   | 621.   |       |       |       | 2323.  | 20.  |     |
|             |                       | 0.    | 0.    | 0.    | 234.   | 401.   | 387.   | 372.   |       |       |       | 1394.  |      |     |
| 79          | SLK SCRIN PRNTNG PCB8 | 0.    | 0.    | 150.  | 0.     | 0.     | 0.     | 0.     | 0.    | 0.    | 0.    | 150.   | 32.  | 3 0 |
|             |                       | 0.    | 0.    | 811.  | 1475.  | 1341.  | 1219.  |        |       |       |       | 4847.  | 24.  |     |
|             |                       | 0.    | 0.    | 609.  | 1107.  | 1006.  | 914.   |        |       |       |       | 3635.  |      |     |
| 54          | WATERSOLFLUXSOL A862  | 0.    | 0.    | 300.  | 150.   | 0.     | 0.     | 0.     | 0.    | 0.    | 0.    | 450.   | 28.  | 3 0 |
|             |                       | 0.    | 0.    | 0.    | 0.     | 1887.  | 4015.  | 3665.  | 3238. |       |       | 12805. | 24.  |     |
|             |                       | 0.    | 0.    | 0.    | 0.     | 1321.  | 3413.  | 3115.  | 2752. |       |       | 10601. |      |     |
| 1           | PCB METAL CORE        | 0.    | 0.    | 85.   | 100.   | 0.     | 0.     | 0.     | 0.    | 0.    | 0.    | 185.   | 19.  | 3 0 |
|             |                       | 0.    | 0.    | 0.    | 585.   | 1001.  | 967.   | 931.   |       |       |       | 3485.  | 11.  |     |
|             |                       | 0.    | 0.    | 0.    | 351.   | 601.   | 580.   | 559.   |       |       |       | 2091.  |      |     |
| 53          | MECH FLEXRG PCB A840  | 0.    | 0.    | 100.  | 200.   | 250.   | 0.     | 0.     | 0.    | 0.    | 0.    | 550.   | 18.  | 3 0 |
|             |                       | 0.    | 0.    | 0.    | 0.     | 0.     | 2540.  | 2734.  | 2486. | 2107. |       | 9867.  | 13.  |     |
|             |                       | 0.    | 0.    | 0.    | 0.     | 0.     | 1778.  | 1914.  | 1780. | 1475. |       | 6907.  |      |     |
| 55          | SWEARFREEPCB A836     | 0.    | 0.    | 150.  | 100.   | 0.     | 0.     | 0.     | 0.    | 0.    | 0.    | 250.   | 18.  | 3 0 |
|             |                       | 0.    | 0.    | 0.    | 738.   | 1341.  | 1219.  | 1108.  |       |       |       | 4407.  | 13.  |     |
|             |                       | 0.    | 0.    | 0.    | 553.   | 1006.  | 914.   | 831.   |       |       |       | 3305.  |      |     |
| 40          | POLYIMIDE MLB A743    | 0.    | 0.    | 200.  | 50.    | 0.     | 0.     | 0.     | 0.    | 0.    | 0.    | 250.   | 9.   | 3 0 |
|             |                       | 0.    | 0.    | 0.    | 390.   | 668.   | 645.   | 621.   |       |       |       | 2323.  | 7.   |     |
|             |                       | 0.    | 0.    | 0.    | 293.   | 501.   | 484.   | 466.   |       |       |       | 1743.  |      |     |
| 2           | PCB CONFORM COATING   | 0.    | 0.    | 115.  | 100.   | 0.     | 0.     | 0.     | 0.    | 0.    | 0.    | 215.   | 5.   | 3 0 |
|             |                       | 0.    | 0.    | 0.    | 0.     | 167.   | 322.   | 310.   | 251.  |       |       | 1051.  | 4.   |     |
|             |                       | 0.    | 0.    | 0.    | 0.     | 117.   | 258.   | 248.   | 201.  |       |       | 624.   |      |     |
|             | INVESTMENT TOTAL      | 0.    | 0.    | 1531. | 760.   | 250.   | 0.     | 0.     | 0.    | 0.    | 0.    | 2541.  | 29.  |     |
|             | SAVINGS TOTAL(U)      | 0.    | 0.    | 4892. | 12317. | 15400. | 20333. | 12764. | 5974. | 2107. | 0.    | 73788. | 22.  |     |
|             | SAVINGS TOTAL(L)      | 0.    | 0.    | 3414. | 9624.  | 11522. | 15710. | 9353.  | 4693. | 1475. | 0.    | 55791. | 22.  |     |

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----- MANUFACTURING TECHNOLOGY STUDY ---- 06/07/77 -----

## ELEMENT - 5 DISC SEMICONDUCTORS

PROJECT COSTS (\$ THOUSANDS)  
ANTICIPATED SAVINGS (\$ THOUSANDS) - UPPER BOUND  
LOWER BOUND  
(ALL FIGURES IN FY 78 DOLLARS)

| PROJ<br>NO. | PROJECT TITLE        | FY 76 | FY 79 | FY 80 | FY 81 | FY 82 | FY 83 | FY 84 | FY 85 | FY 86 | FY 87 | TOTAL | S/I | Y   |
|-------------|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----|-----|
| 34          | POLY-SIL COAT A6308  | 0.    | 0.    | 100.  | 0.    | 0.    | 0.    | 0.    | 0.    | 0.    | 0.    | 100.  | 7.  | 3 0 |
|             |                      | 0.    | 0.    | 0.    | 123.  | 224.  | 203.  | 185.  |       |       |       | 734.  | 4.  |     |
|             |                      | 0.    | 0.    | 0.    | 74.   | 134.  | 122.  | 111.  |       |       |       | 441.  |     |     |
| 22          | ESS DEVICES DNE042   | 0.    | 0.    | 280.  | 0.    | 0.    | 0.    | 0.    | 0.    | 0.    | 0.    | 280.  | 3.  | 3 0 |
|             |                      | 0.    | 0.    | 271.  | 246.  | 224.  | 203.  | 0.    |       |       |       | 943.  | 1.  |     |
|             |                      | 0.    | 0.    | 81.   | 74.   | 67.   | 61.   | 0.    |       |       |       | 263.  |     |     |
| 71          | PROJECTION LITH SAM  | 0.    | 0.    | 60.   | 60.   | 0.    | 0.    | 0.    | 0.    | 0.    | 0.    | 120.  | 2.  | 3 0 |
|             |                      | 0.    | 0.    | 0.    | 30.   | 48.   | 61.   | 54.   |       |       |       | 192.  | 1.  |     |
|             |                      | 0.    | 0.    | 0.    | 15.   | 30.   | 49.   | 43.   |       |       |       | 145.  |     |     |
| 33          | GAAS FET A6218       | 0.    | 0.    | 250.  | 250.  | 0.    | 0.    | 0.    | 0.    | 0.    | 0.    | 500.  | 2.  | 3 0 |
|             |                      | 0.    | 0.    | 0.    | 0.    | 224.  | 203.  | 185.  | 168.  |       |       | 779.  | 1.  |     |
|             |                      | 0.    | 0.    | 0.    | 0.    | 157.  | 142.  | 129.  | 118.  |       |       | 546.  |     |     |
| 38          | GA-AS ICSMICRONA1218 | 0.    | 0.    | 500.  | 500.  | 0.    | 0.    | 0.    | 0.    | 0.    | 0.    | 1000. | 1.  | 3 0 |
|             |                      | 0.    | 0.    | 0.    | 0.    | 224.  | 203.  | 185.  | 168.  |       |       | 779.  | 1.  |     |
|             |                      | 0.    | 0.    | 0.    | 0.    | 179.  | 163.  | 148.  | 134.  |       |       | 624.  |     |     |
| 89          | GAAS FET VL IM A6188 | 0.    | 0.    | 650.  | 650.  | 0.    | 0.    | 0.    | 0.    | 0.    | 0.    | 1300. | 1.  | 3 0 |
|             |                      | 0.    | 0.    | 0.    | 246.  | 224.  | 203.  | 185.  | 0.    |       |       | 857.  | 0.  |     |
|             |                      | 0.    | 0.    | 0.    | 123.  | 112.  | 102.  | 92.   | 0.    |       |       | 429.  |     |     |
|             | INVESTMENT TOTAL     | 0.    | 0.    | 1840. | 1460. | 0.    | 0.    | 0.    | 0.    | 0.    | 0.    | 3300. | 1.  |     |
|             | SAVINGS TOTAL(U)     | 0.    | 0.    | 271.  | 644.  | 1165. | 1077. | 793.  | 336.  |       |       | 4286. | 1.  |     |
|             | SAVINGS TOTAL(L)     | 0.    | 0.    | 81.   | 285.  | 686.  | 638.  | 524.  | 252.  |       |       | 2466. | 1.  |     |

----- MANUFACTURING TECHNOLOGY STUDY ---- 06/07/77 -----

## ELEMENT - 6 HYBRID CIRCUITS

PROJECT COSTS (\$ THOUSANDS)  
ANTICIPATED SAVINGS (\$ THOUSANDS) - UPPER BOUND  
LOWER BOUND  
(ALL FIGURES IN FY 78 DOLLARS)

| PROJ<br>NO. | PROJECT TITLE         | FY 78 | FY 79 | FY 80 | FY 81 | FY 82  | FY 83  | FY 84  | FY 85 | FY 86 | FY 87 | TOTAL  | 3/1 | Y   |
|-------------|-----------------------|-------|-------|-------|-------|--------|--------|--------|-------|-------|-------|--------|-----|-----|
| 68          | HYBRID SEAL RINGS     | 0.    | 0.    | 70.   | 0.    | 0.     | 0.     | 0.     | 0.    | 0.    | 0.    | 70.    | 52. | 3 0 |
|             |                       | 0.    | 0.    | 0.    | 610.  | 1043.  | 1008.  | 970.   | 0.    | 0.    | 0.    | 3630.  | 41. |     |
|             |                       | 0.    | 0.    | 0.    | 488.  | 835.   | 806.   | 776.   | 0.    | 0.    | 0.    | 2904.  |     |     |
| 43          | L3HYBRID ASSY A116A   | 0.    | 0.    | 150.  | 150.  | 0.     | 0.     | 0.     | 0.    | 0.    | 0.    | 300.   | 50. | 3 0 |
|             |                       | 0.    | 0.    | 0.    | 0.    | 2096.  | 6350.  | 3464.  | 3149. | 0.    | 0.    | 15059. | 35. |     |
|             |                       | 0.    | 0.    | 0.    | 0.    | 1467.  | 4445.  | 2425.  | 2204. | 0.    | 0.    | 10541. |     |     |
| 7           | GANG PROBE HYB TEST   | 0.    | 0.    | 20.   | 20.   | 0.     | 0.     | 0.     | 0.    | 0.    | 0.    | 40.    | 40. | 2 0 |
|             |                       | 0.    | 0.    | 0.    | 268.  | 459.   | 443.   | 427.   | 0.    | 0.    | 0.    | 1597.  | 34. |     |
|             |                       | 0.    | 0.    | 0.    | 228.  | 390.   | 377.   | 363.   | 0.    | 0.    | 0.    | 1358.  |     |     |
| 16          | HYBRD LAS BND DNAS79  | 0.    | 0.    | 250.  | 150.  | 0.     | 0.     | 0.     | 0.    | 0.    | 0.    | 400.   | 21. | 3 0 |
|             |                       | 0.    | 0.    | 0.    | 1380. | 2358.  | 2510.  | 2291.  | 0.    | 0.    | 0.    | 8539.  | 11. |     |
|             |                       | 0.    | 0.    | 0.    | 690.  | 1179.  | 1255.  | 1145.  | 0.    | 0.    | 0.    | 4269.  |     |     |
| 17          | IONRESISTITRIM DNAS77 | 0.    | 0.    | 250.  | 180.  | 0.     | 0.     | 0.     | 0.    | 0.    | 0.    | 430.   | 20. | 3 0 |
|             |                       | 0.    | 0.    | 0.    | 1380. | 2358.  | 2510.  | 2291.  | 0.    | 0.    | 0.    | 8539.  | 15. |     |
|             |                       | 0.    | 0.    | 0.    | 1035. | 1769.  | 1882.  | 1718.  | 0.    | 0.    | 0.    | 6404.  |     |     |
| 13          | AUTO-HYB ASSEMBLY     | 0.    | 0.    | 120.  | 250.  | 250.   | 0.     | 0.     | 0.    | 0.    | 0.    | 620.   | 12. | 1 2 |
|             |                       | 0.    | 0.    | 0.    | 1378. | 1830.  | 2278.  | 2125.  | 0.    | 0.    | 0.    | 7610.  | 6.  |     |
|             |                       | 0.    | 0.    | 0.    | 689.  | 915.   | 1139.  | 1062.  | 0.    | 0.    | 0.    | 3805.  |     |     |
| 19          | HYBRID LID DEV DNAS2  | 0.    | 0.    | 55.   | 85.   | 55.    | 0.     | 0.     | 0.    | 0.    | 0.    | 195.   | 8.  | 3 0 |
|             |                       | 0.    | 0.    | 0.    | 0.    | 231.   | 476.   | 427.   | 388.  | 0.    | 0.    | 1523.  | 4.  |     |
|             |                       | 0.    | 0.    | 0.    | 0.    | 116.   | 238.   | 214.   | 194.  | 0.    | 0.    | 761.   |     |     |
| 99          | LASR INSP HYBD CIR.   | 0.    | 0.    | 150.  | 150.  | 0.     | 0.     | 0.     | 0.    | 0.    | 0.    | 300.   | 7.  | 2 0 |
|             |                       | 0.    | 0.    | 0.    | 307.  | 699.   | 635.   | 577.   | 0.    | 0.    | 0.    | 2218.  | 7.  |     |
|             |                       | 0.    | 0.    | 0.    | 231.  | 629.   | 572.   | 520.   | 0.    | 0.    | 0.    | 1950.  |     |     |
| 8           | REWORK STD HYB CIR    | 0.    | 0.    | 200.  | 200.  | 200.   | 0.     | 0.     | 0.    | 0.    | 0.    | 600.   | 6.  | 4 0 |
|             |                       | 0.    | 0.    | 0.    | 610.  | 782.   | 1008.  | 970.   | 0.    | 0.    | 0.    | 3369.  | 4.  |     |
|             |                       | 0.    | 0.    | 0.    | 457.  | 587.   | 756.   | 727.   | 0.    | 0.    | 0.    | 2527.  |     |     |
|             | INVESTMENT TOTAL      | 0.    | 0.    | 1265. | 1185. | 505.   | 0.     | 0.     | 0.    | 0.    | 0.    | 2955.  | 18. |     |
|             | SAVINGS TOTAL(U)      | 0.    | 0.    | 0.    | 5933. | 11856. | 17217. | 13541. | 3537. | 0.    | 0.    | 52084. | 12. |     |
|             | SAVINGS TOTAL(L)      | 0.    | 0.    | 0.    | 3817. | 7885.  | 11469. | 8950.  | 2398. | 0.    | 0.    | 34520. |     |     |

----- MANUFACTURING TECHNOLOGY STUDY --- 06/07/77 -----

ELEMENT - 7 PASSIVE COMPONENTS

PROJECT COSTS (\$ THOUSANDS)  
ANTICIPATED SAVINGS (\$ THOUSANDS) - UPPER BOUND  
LOWER BOUND  
(ALL FIGURES IN FY 78 DOLLARS)

| PROJ<br>NO. | PROJECT TITLE        | FY 78 | FY 79 | FY 80 | FY 81 | FY 82 | FY 83 | FY 84 | FY 85 | FY 86 | FY 87 | TOTAL | S/I | Y   |
|-------------|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----|-----|
| 31          | LOW COST CAPACT A503 | 0.    | 0.    | 100.  | 50.   | 0.    | 0.    | 0.    | 0.    | 0.    | 0.    | 150.  | 7.  | 1 0 |
|             |                      | 0.    | 0.    | 0.    | 0.    | 168.  | 305.  | 277.  | 252.  | 0.    | 0.    | 1002. | 5.  |     |
|             |                      | 0.    | 0.    | 0.    | 0.    | 134.  | 244.  | 222.  | 202.  |       |       | 801.  |     |     |
| 100         | MONLTH CERAMIC CAP.  | 0.    | 0.    | 80.   | 190.  | 0.    | 0.    | 0.    | 0.    | 0.    | 0.    | 270.  | 4.  | 3 0 |
|             |                      | 0.    | 0.    | 0.    | 246.  | 335.  | 305.  | 277.  | 0.    | 0.    | 0.    | 1163. | 4.  |     |
|             |                      | 0.    | 0.    | 0.    | 184.  | 302.  | 274.  | 249.  | 0.    |       |       | 1010. | 4.  |     |
| 90          | EP YIG FILT A508     | 0.    | 0.    | 250.  | 350.  | 0.    | 0.    | 0.    | 0.    | 0.    | 0.    | 600.  | 1.  | 3 0 |
|             |                      | 0.    | 0.    | 0.    | 62.   | 112.  | 102.  | 92.   | 0.    | 0.    | 0.    | 367.  | 0.  |     |
|             |                      | 0.    | 0.    | 0.    | 31.   | 56.   | 51.   | 46.   |       |       |       | 184.  |     |     |
| 16          | SAM REPLICATN DNAS08 | 0.    | 0.    | 250.  | 0.    | 0.    | 0.    | 0.    | 0.    | 0.    | 0.    | 250.  | 0.  | 3 0 |
|             |                      | 0.    | 0.    | 0.    | 12.   | 22.   | 20.   | 19.   | 0.    | 0.    | 0.    | 73.   | 0.  |     |
|             |                      | 0.    | 0.    | 0.    | 6.    | 11.   | 10.   | 9.    |       |       |       | 37.   | 0.  |     |
|             | INVESTMENT TOTAL     | 0.    | 0.    | 680.  | 540.  | 0.    | 0.    | 0.    | 0.    | 0.    | 0.    | 1270. |     |     |
|             | SAVINGS TOTAL(U)     | 0.    | 0.    | 0.    | 320.  | 637.  | 732.  | 665.  | 252.  |       |       | 2605. | 2.  |     |
|             | SAVINGS TOTAL(L)     | 0.    | 0.    | 0.    | 221.  | 503.  | 579.  | 527.  | 202.  |       |       | 2031. | 2.  |     |



----- MANUFACTURING TECHNOLOGY STUDY --- 06/07/77 -----

## ELEMENT - 0 ASSEMBLY LABOR

PROJECT COSTS (\$ THOUSANDS)  
ANTICIPATED SAVINGS (\$ THOUSANDS) - UPPER BOUND  
LOWER BOUND  
(ALL FIGURES IN FY 78 DOLLARS)

| PROJ<br>NO. | PROJECT TITLE        | FY 78 | FY 79 | FY 80 | FY 81 | FY 82  | FY 83  | FY 84  | FY 85 | FY 86 | FY 87 | TOTAL  | S/I | Y   |
|-------------|----------------------|-------|-------|-------|-------|--------|--------|--------|-------|-------|-------|--------|-----|-----|
| 102         | OP.ASST.ASSPBL A805  | 0.    | 0.    | 70.   | 0.    | 0.     | 0.     | 0.     | 0.    | 0.    | 0.    | 70.    | 87. | 2 0 |
|             |                      | 0.    | 0.    | 1014. | 1844. | 1577.  | 1524.  | 0.     | 0.    | 0.    | 0.    | 6059.  | 65. |     |
|             |                      | 0.    | 0.    | 761.  | 1303. | 1257.  | 1143.  | 0.     | 0.    | 0.    | 0.    | 4544.  |     |     |
| 4           | SOLDER SPC.IPLACE    | 0.    | 0.    | 350.  | 350.  | 0.     | 0.     | 0.     | 0.    | 0.    | 0.    | 700.   | 27. | 4 0 |
|             |                      | 0.    | 0.    | 0.    | 3356. | 4317.  | 5660.  | 5242.  | 0.    | 0.    | 0.    | 18682. | 21. |     |
|             |                      | 0.    | 0.    | 0.    | 1678. | 3313.  | 5101.  | 4717.  | 0.    | 0.    | 0.    | 14809. |     |     |
| 46          | AUTOPCBCOMPINSERT    | 0.    | 0.    | 50.   | 0.    | 0.     | 0.     | 0.     | 0.    | 0.    | 0.    | 50.    | 22. | 2 0 |
|             |                      | 0.    | 0.    | 0.    | 184.  | 335.   | 305.   | 277.   | 0.    | 0.    | 0.    | 1102.  | 20. |     |
|             |                      | 0.    | 0.    | 0.    | 166.  | 302.   | 274.   | 249.   | 0.    | 0.    | 0.    | 992.   |     |     |
| 81          | STD.AUTOM.INTERFACES | 0.    | 0.    | 50.   | 50.   | 50.    | 0.     | 0.     | 0.    | 0.    | 0.    | 150.   | 10. | 4 0 |
|             |                      | 0.    | 0.    | 0.    | 461.  | 838.   | 762.   | 693.   | 0.    | 0.    | 0.    | 2754.  | 17. |     |
|             |                      | 0.    | 0.    | 0.    | 415.  | 754.   | 686.   | 624.   | 0.    | 0.    | 0.    | 2479.  |     |     |
| 50          | AUTO WIRE SYS        | 0.    | 0.    | 500.  | 1000. | 1000.  | 0.     | 0.     | 0.    | 0.    | 0.    | 2500.  | 13. | 2 3 |
|             |                      | 0.    | 0.    | 0.    | 0.    | 4191.  | 7620.  | 10392. | 9447. | 0.    | 0.    | 31650. | 9.  |     |
|             |                      | 0.    | 0.    | 0.    | 0.    | 2934.  | 5334.  | 7274.  | 6613. | 0.    | 0.    | 22155. |     |     |
| 82          | HIERARCH.CONTROL     | 0.    | 0.    | 50.   | 50.   | 0.     | 0.     | 0.     | 0.    | 0.    | 0.    | 100.   | 6.  | 3 0 |
|             |                      | 0.    | 0.    | 0.    | 92.   | 168.   | 152.   | 139.   | 0.    | 0.    | 0.    | 551.   | 5.  |     |
|             |                      | 0.    | 0.    | 0.    | 83.   | 151.   | 137.   | 125.   | 0.    | 0.    | 0.    | 496.   |     |     |
| 72          | TECH SM.COURSE       | 0.    | 0.    | 600.  | 1000. | 0.     | 0.     | 0.     | 0.    | 0.    | 0.    | 1600.  | 4.  | 4 0 |
|             |                      | 0.    | 0.    | 0.    | 1463. | 1078.  | 1814.  | 1746.  | 0.    | 0.    | 0.    | 6900.  | 2.  |     |
|             |                      | 0.    | 0.    | 0.    | 732.  | 939.   | 907.   | 873.   | 0.    | 0.    | 0.    | 3450.  |     |     |
| 83          | TACTILE SENSORS      | 0.    | 0.    | 150.  | 200.  | 200.   | 0.     | 0.     | 0.    | 0.    | 0.    | 550.   | 1.  | 3 0 |
|             |                      | 0.    | 0.    | 0.    | 0.    | 84.    | 152.   | 139.   | 0.    | 0.    | 0.    | 501.   | 0.  |     |
|             |                      | 0.    | 0.    | 0.    | 0.    | 42.    | 76.    | 69.    | 0.    | 0.    | 0.    | 250.   |     |     |
|             | INVESTMENT TOTAL     | 0.    | 0.    | 1820. | 2650. | 1250.  | 0.     | 0.     | 0.    | 0.    | 0.    | 5720.  | 12. |     |
|             | SAVINGS TOTAL(U)     | 0.    | 0.    | 1014. | 7400. | 13587. | 17998. | 18626. | 9573. | 0.    | 0.    | 68198. | 9.  |     |
|             | SAVINGS TOTAL(L)     | 0.    | 0.    | 761.  | 4456. | 9692.  | 13659. | 13931. | 6676. | 0.    | 0.    | 49175. |     |     |

----- MANUFACTURING TECHNOLOGY STUDY --- 06/07/77 -----

ELEMENT - 9 FABRICATION LABOR

PROJECT COSTS (\$ THOUSANDS)  
ANTICIPATED SAVINGS (\$ THOUSANDS) - UPPER BOUND  
LOWER BOUND  
(ALL FIGURES IN FY 78 DOLLARS)

| PROJ<br>NO. | PROJECT TITLE         | FY 76 | FY 79 | FY 80 | FY 81 | FY 82 | FY 83 | FY 84 | FY 85 | FY 86 | FY 87 | TOTAL | S/I | V   |
|-------------|-----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----|-----|
| 77          | AV.MC MACH CONTROL    | 0.    | 0.    | 200.  | 200.  | 0.    | 0.    | 0.    | 0.    | 0.    | 0.    | 400.  | 15. | 3 0 |
|             |                       | 0.    | 0.    | 0.    | 975.  | 1669. | 1612. | 1552. | 0.    | 0.    | 0.    | 5608. | 11. |     |
|             |                       | 0.    | 0.    | 0.    | 732.  | 1252. | 1209. | 1164. |       |       |       | 4356. |     |     |
| 45          | AUTO STD MACH PROCESS | 0.    | 0.    | 250.  | 250.  | 0.    | 0.    | 0.    | 0.    | 0.    | 0.    | 500.  | 7.  | 2 0 |
|             |                       | 0.    | 0.    | 0.    | 615.  | 1118. | 1016. | 924.  | 0.    | 0.    | 0.    | 3672. | 7.  |     |
|             |                       | 0.    | 0.    | 0.    | 553.  | 1006. | 914.  | 831.  |       |       |       | 3305. |     |     |
|             | INVESTMENT TOTAL      | 0.    | 0.    | 450.  | 450.  | 0.    | 0.    | 0.    | 0.    | 0.    | 0.    | 900.  | 11. |     |
|             | SAVINGS TOTAL(U)      | 0.    | 0.    | 0.    | 1590. | 2787. | 2628. | 2476. |       |       |       | 9480. | 9.  |     |
|             | SAVINGS TOTAL(L)      | 0.    | 0.    | 0.    | 1285. | 2258. | 2124. | 1995. |       |       |       | 7661. |     |     |



----- MANUFACTURING TECHNOLOGY STUDY --- 06/07/77 -----

ELEMENT - 10 SUPPORT LABOR

PROJECT COSTS (\$ THOUSANDS)  
ANTICIPATED SAVINGS (\$ THOUSANDS) - UPPER BOUND  
LOWER BOUND  
(ALL FIGURES IN FY 78 DOLLARS)

| PROJ<br>NO. | PROJECT TITLE        | FY 78 | FY 79 | FY 80 | FY 81 | FY 82  | FY 83  | FY 84  | FY 85 | FY 86 | FY 87 | TOTAL  | S/I | Y   |
|-------------|----------------------|-------|-------|-------|-------|--------|--------|--------|-------|-------|-------|--------|-----|-----|
| 11          | DATA LNK-SUPPLR/ASMB | 0.    | 0.    | 50.   | 0.    | 1464.  | 1367.  | 1275.  | 0.    | 0.    | 0.    | 50.    | 99. | 1 0 |
|             |                      | 0.    | 0.    | 0.    | 827.  | 1098.  | 1025.  | 956.   |       |       |       | 4932.  | 74. |     |
| 67          | N/C CALIBRATION      | 0.    | 0.    | 30.   | 0.    | 0.     | 0.     | 0.     | 0.    | 0.    | 0.    | 30.    | 85. | 3 0 |
|             |                      | 0.    | 0.    | 0.    | 732.  | 626.   | 605.   | 582.   |       |       |       | 2584.  | 68. |     |
|             |                      | 0.    | 0.    | 0.    | 585.  | 501.   | 484.   | 466.   |       |       |       | 2035.  |     |     |
| 51          | COMP SHOP INSTRUCT   | 0.    | 0.    | 200.  | 0.    | 0.     | 0.     | 0.     | 0.    | 0.    | 0.    | 200.   | 40. | 2 0 |
|             |                      | 0.    | 0.    | 0.    | 2305. | 2096.  | 1905.  | 1732.  |       |       |       | 8038.  | 28. |     |
|             |                      | 0.    | 0.    | 0.    | 1614. | 1467.  | 1334.  | 1212.  |       |       |       | 5627.  |     |     |
| 3           | GROUP TECH/PARTS CLS | 0.    | 0.    | 180.  | 160.  | 285.   | 125.   | 0.     | 0.    | 0.    | 0.    | 750.   | 24. | 2 0 |
|             |                      | 0.    | 0.    | 0.    | 0.    | 1840.  | 3543.  | 6552.  | 6007. |       |       | 17982. | 12. |     |
|             |                      | 0.    | 0.    | 0.    | 0.    | 920.   | 1771.  | 3276.  | 3003. |       |       | 8971.  |     |     |
| 76          | CAD WIRE WRNSS-SFTMR | 0.    | 0.    | 120.  | 0.    | 0.     | 0.     | 0.     | 0.    | 0.    | 0.    | 120.   | 20. | 2 0 |
|             |                      | 0.    | 0.    | 450.  | 732.  | 626.   | 605.   |        |       |       |       | 2412.  | 15. |     |
|             |                      | 0.    | 0.    | 337.  | 549.  | 469.   | 453.   |        |       |       |       | 1809.  |     |     |
| 80          | OK REACTION ENG.CAP. | 0.    | 0.    | 500.  | 600.  | 1000.  | 0.     | 0.     | 0.    | 0.    | 0.    | 2100.  | 10. | 2 0 |
|             |                      | 0.    | 0.    | 0.    | 3658. | 4694.  | 6046.  | 5819.  |       |       |       | 20216. | 5.  |     |
|             |                      | 0.    | 0.    | 0.    | 1829. | 2347.  | 3023.  | 2910.  |       |       |       | 10108. |     |     |
|             | INVESTMENT TOTAL     | 0.    | 0.    | 1080. | 740.  | 1285.  | 125.   | 0.     | 0.    | 0.    | 0.    | 3250.  | 17. |     |
|             | SAVINGS TOTAL(U)     | 0.    | 0.    | 450.  | 8252. | 11346. | 14069. | 15960. | 4007. |       |       | 56084. | 10. |     |
|             | SAVINGS TOTAL(L)     | 0.    | 0.    | 337.  | 5196. | 6802.  | 8090.  | 8819.  | 3003. |       |       | 32249. |     |     |

MANUFACTURING TECHNOLOGY STUDY ---- 06/07/77 -----

ELEMENT - 11 TEST LABOR

PROJECT COSTS (\$ THOUSANDS)  
ANTICIPATED SAVINGS (\$ THOUSANDS) - UPPER BOUND  
LOWER BOUND  
(ALL FIGURES IN FY 78 DOLLARS)

| PROJ NO. | PROJECT TITLE        | FY 78 | FY 79 | FY 80 | FY 81 | FY 82  | FY 83  | FY 84  | FY 85  | FY 86  | FY 87 | TOTAL   | S/I  | Y   |
|----------|----------------------|-------|-------|-------|-------|--------|--------|--------|--------|--------|-------|---------|------|-----|
| 12       | AUTO FAULT ISOLATION | 0.    | 0.    | 100.  | 100.  | 45042. | 9111.  | 8498.  | 0.     | 0.     | 0.    | 200.    | 391. | 2 0 |
|          |                      | 0.    | 0.    | 0.    | 5512. | 4134.  | 33781. | 6033.  | 6373.  |        |       | 68182.  | 256. |     |
| 61       | TEST OPTM MODEL A213 | 0.    | 0.    | 150.  | 200.  | 0.     | 0.     | 0.     | 0.     | 0.     | 0.    | 350.    | 152. | 3 0 |
|          |                      | 0.    | 0.    | 0.    | 0.    | 7861.  | 16731. | 15272. | 13491. |        |       | 53355.  | 114. |     |
|          |                      | 0.    | 0.    | 0.    | 0.    | 5896.  | 12548. | 11454. | 10119. |        |       | 40016.  |      |     |
| 59       | PCB OCR INSP. A266   | 0.    | 0.    | 200.  | 300.  | 300.   | 0.     | 0.     | 0.     | 0.     | 0.    | 800.    | 72.  | 2 3 |
|          |                      | 0.    | 0.    | 0.    | 0.    | 0.     | 16731. | 15272. | 13491. | 11807. |       | 57301.  | 57.  |     |
|          |                      | 0.    | 0.    | 0.    | 0.    | 0.     | 13385. | 12217. | 10793. | 9446.  |       | 45841.  |      |     |
| 10       | INTERACTIVE TESTING  | 0.    | 0.    | 50.   | 0.    | 0.     | 0.     | 0.     | 0.     | 0.     | 0.    | 50.     | 64.  | 2 0 |
|          |                      | 0.    | 0.    | 600.  | 975.  | 835.   | 806.   |        |        |        |       | 3216.   | 45.  |     |
|          |                      | 0.    | 0.    | 420.  | 683.  | 584.   | 564.   |        |        |        |       | 2251.   |      |     |
| 62       | IMPROVDANALOGCIR251  | 0.    | 0.    | 60.   | 40.   | 0.     | 0.     | 0.     | 0.     | 0.     | 0.    | 100.    | 18.  | 3 0 |
|          |                      | 0.    | 0.    | 0.    | 307.  | 559.   | 508.   | 462.   |        |        |       | 1836.   | 11.  |     |
|          |                      | 0.    | 0.    | 0.    | 184.  | 335.   | 305.   | 277.   |        |        |       | 1102.   |      |     |
| 64       | AUTO PCB TST EQ A265 | 0.    | 0.    | 150.  | 0.    | 0.     | 0.     | 0.     | 0.     | 0.     | 0.    | 150.    | 12.  | 3 0 |
|          |                      | 0.    | 0.    | 0.    | 307.  | 559.   | 508.   | 462.   |        |        |       | 1836.   | 6.   |     |
|          |                      | 0.    | 0.    | 0.    | 154.  | 279.   | 254.   | 231.   |        |        |       | 918.    |      |     |
|          | INVESTMENT TOTAL     | 0.    | 0.    | 710.  | 640.  | 300.   | 0.     | 0.     | 0.     | 0.     | 0.    | 1650.   | 113. |     |
|          | SAVINGS TOTAL(U)     | 0.    | 0.    | 600.  | 7102. | 54855. | 44395. | 39965. | 26983. | 11807. |       | 185766. | 86.  |     |
|          | SAVINGS TOTAL(L)     | 0.    | 0.    | 420.  | 5155. | 40876. | 33889. | 30552. | 20912. | 9446.  |       | 141249. |      |     |

METHOD OF COST SAVING - 1 VOLUME

PROJECT COST (\$, THOUSANDS)  
ANTICIPATED SAVINGS (\$, THOUSANDS) - UPPER BOUND  
LOWER BOUND  
(ALL FIGURES IN FY 78 DOLLARS)

| PROJ NO. | PROJECT TITLE        | FY 78 | FY 79 | FY 80 | FY 81 | FY 82  | FY 83  | FY 84  | FY 85  | FY 86  | FY 87 | TOTAL   | 9/1  | X  |
|----------|----------------------|-------|-------|-------|-------|--------|--------|--------|--------|--------|-------|---------|------|----|
| 32       | F18 OPT SIG CBL A314 | 0.    | 0.    | 250.  | 250.  | 150.   | 0.     | 0.     | 0.     | 0.     | 0.    | 650.    | 71.  | 1  |
|          |                      | 0.    | 0.    | 0.    | 0.    | 0.     | 7938.  | 14240. | 12946. | 10974. | 0.    | 46097.  | 57.  |    |
|          |                      | 0.    | 0.    | 0.    | 0.    | 0.     | 7938.  | 14240. | 12946. | 10974. | 0.    | 36878.  |      |    |
| 84       | RE-EMBODIMENT LSI    | 0.    | 0.    | 200.  | 250.  | 500.   | 0.     | 0.     | 0.     | 0.     | 0.    | 950.    | 30.  | 3  |
|          |                      | 0.    | 0.    | 0.    | 0.    | 4750.  | 8637.  | 7851.  | 7138.  | 0.     | 0.    | 28375.  | 27.  |    |
|          |                      | 0.    | 0.    | 0.    | 0.    | 4750.  | 8637.  | 7851.  | 7138.  | 0.     | 0.    | 25538.  |      |    |
| 66       | CMOS CUSTOM LIB A124 | 0.    | 0.    | 250.  | 250.  | 250.   | 0.     | 0.     | 0.     | 0.     | 0.    | 750.    | 22.  | 3  |
|          |                      | 0.    | 0.    | 0.    | 0.    | 4750.  | 4318.  | 3926.  | 3569.  | 0.     | 0.    | 16563.  | 20.  |    |
|          |                      | 0.    | 0.    | 0.    | 0.    | 4750.  | 4318.  | 3926.  | 3569.  | 0.     | 0.    | 14906.  |      |    |
| 86       | GLUE AV-CHASIS A802  | 0.    | 0.    | 100.  | 0.    | 0.     | 0.     | 0.     | 0.     | 0.     | 0.    | 100.    | 151. | 1  |
|          |                      | 0.    | 0.    | 2029. | 4610. | 3726.  | 4763.  | ...    | 0.     | 0.     | 0.    | 15127.  | 136. |    |
|          |                      | 0.    | 0.    | 2029. | 4610. | 3726.  | 4763.  | ...    | 0.     | 0.     | 0.    | 13615.  |      |    |
| 35       | ULTRATHIN MICROC A72 | 0.    | 0.    | 220.  | 160.  | 0.     | 0.     | 0.     | 0.     | 0.     | 0.    | 380.    | 24.  | 3  |
|          |                      | 0.    | 0.    | 0.    | 0.    | 1336.  | 2844.  | 2596.  | 2294.  | 0.     | 0.    | 9070.   | 10.  |    |
|          |                      | 0.    | 0.    | 0.    | 0.    | 1336.  | 2844.  | 2596.  | 2294.  | 0.     | 0.    | 3628.   |      |    |
| 13       | AUTO-HYB ASSEMBLY    | 0.    | 0.    | 120.  | 250.  | 250.   | 0.     | 0.     | 0.     | 0.     | 0.    | 620.    | 12.  | 6  |
|          |                      | 0.    | 0.    | 0.    | 1378. | 1830.  | 2278.  | 2125.  | 0.     | 0.     | 0.    | 7610.   | 6.   |    |
|          |                      | 0.    | 0.    | 0.    | 1378. | 1830.  | 2278.  | 2125.  | 0.     | 0.     | 0.    | 3805.   |      |    |
| 11       | DATA LNK-SUPPLR/ASMB | 0.    | 0.    | 50.   | 0.    | 0.     | 0.     | 0.     | 0.     | 0.     | 0.    | 50.     | 99.  | 10 |
|          |                      | 0.    | 0.    | 0.    | 827.  | 1464.  | 1367.  | 1275.  | 0.     | 0.     | 0.    | 4932.   | 74.  |    |
|          |                      | 0.    | 0.    | 0.    | 827.  | 1464.  | 1367.  | 1275.  | 0.     | 0.     | 0.    | 3699.   |      |    |
| 41       | AUTOMATED TMT 603A   | 0.    | 0.    | 150.  | 225.  | 0.     | 0.     | 0.     | 0.     | 0.     | 0.    | 375.    | 6.   | 2  |
|          |                      | 0.    | 0.    | 0.    | 0.    | 349.   | 635.   | 577.   | 525.   | 0.     | 0.    | 2086.   | 4.   |    |
|          |                      | 0.    | 0.    | 0.    | 0.    | 349.   | 635.   | 577.   | 525.   | 0.     | 0.    | 1461.   |      |    |
| 94       | VAC LOCK CTNG A332   | 0.    | 0.    | 200.  | 150.  | 0.     | 0.     | 0.     | 0.     | 0.     | 0.    | 350.    | 5.   | 2  |
|          |                      | 0.    | 0.    | 0.    | 305.  | 522.   | 504.   | 485.   | 0.     | 0.     | 0.    | 1815.   | 5.   |    |
|          |                      | 0.    | 0.    | 0.    | 305.  | 522.   | 504.   | 485.   | 0.     | 0.     | 0.    | 1588.   |      |    |
| 31       | LOW COST CAPACT A503 | 0.    | 0.    | 100.  | 50.   | 0.     | 0.     | 0.     | 0.     | 0.     | 0.    | 150.    | 7.   | 7  |
|          |                      | 0.    | 0.    | 0.    | 0.    | 168.   | 305.   | 277.   | 252.   | 0.     | 0.    | 1002.   | 5.   |    |
|          |                      | 0.    | 0.    | 0.    | 0.    | 168.   | 305.   | 277.   | 252.   | 0.     | 0.    | 801.    |      |    |
|          | INVESTMENT TOTAL     | 0.    | 0.    | 1640. | 1585. | 1150.  | 0.     | 0.     | 0.     | 0.     | 0.    | 4375.   | 30.  |    |
|          | SAVINGS TOTAL(U)     | 0.    | 0.    | 2029. | 7120. | 18895. | 33588. | 33352. | 26722. | 10974. | 0.    | 132678. | 24.  |    |
|          | SAVINGS TOTAL(L)     | 0.    | 0.    | 1826. | 5687. | 15299. | 26739. | 26110. | 21479. | 8779.  | 0.    | 105918. |      |    |



MANUFACTURING TECHNOLOGY STUDY --- 06/07/77

## METHOD OF COST SAVING - 2 CAPITAL EXPENDITURE

PROJECT COST (\$, THOUSANDS)  
 ANTICIPATED SAVINGS (\$, THOUSANDS) - UPPER BOUND  
 LOWER BOUND  
 (ALL FIGURES IN FY 78 DOLLARS)

| PROJ<br>NO. | PROJECT TITLE        | FY 76 | FY 79 | FY 80 | FY 81 | FY 82  | FY 83  | FY 84  | FY 85  | FY 86  | FY 87 | TOTAL  | S/I  | X  |
|-------------|----------------------|-------|-------|-------|-------|--------|--------|--------|--------|--------|-------|--------|------|----|
| 12          | AUTO FAULT ISOLATION | 0.    | 0.    | 100.  | 100.  | 45042. | 9111.  | 8498.  | 0.     | 0.     | 0.    | 200.   | 341. | 11 |
|             |                      | 0.    | 0.    | 0.    | 5512. | 45042. | 9111.  | 8498.  | 0.     | 0.     | 0.    | 68162. | 256. |    |
|             |                      | 0.    | 0.    | 0.    | 5512. | 45042. | 9111.  | 8498.  | 0.     | 0.     | 0.    | 51122. |      |    |
| 59          | PCB OCR INSP. A266   | 0.    | 0.    | 200.  | 300.  | 300.   | 0.     | 0.     | 0.     | 0.     | 0.    | 800.   | 72.  | 11 |
|             |                      | 0.    | 0.    | 0.    | 0.    | 0.     | 16731. | 15272. | 13491. | 11807. | 0.    | 57301. | 57.  |    |
|             |                      | 0.    | 0.    | 0.    | 0.    | 0.     | 16731. | 15272. | 13491. | 11807. | 0.    | 45841. |      |    |
| 50          | AUTO WIRE SYS        | 0.    | 0.    | 500.  | 1000. | 1000.  | 0.     | 0.     | 0.     | 0.     | 0.    | 2500.  | 13.  | 8  |
|             |                      | 0.    | 0.    | 0.    | 0.    | 4191.  | 7620.  | 10392. | 9447.  | 0.     | 0.    | 31650. | 9.   |    |
|             |                      | 0.    | 0.    | 0.    | 0.    | 4191.  | 7620.  | 10392. | 9447.  | 0.     | 0.    | 22155. |      |    |
| 80          | OK REACTON ENG.CAP.  | 0.    | 0.    | 500.  | 600.  | 1000.  | 0.     | 0.     | 0.     | 0.     | 0.    | 2100.  | 10.  | 10 |
|             |                      | 0.    | 0.    | 0.    | 3658. | 4694.  | 6046.  | 5819.  | 0.     | 0.     | 0.    | 20216. | 5.   |    |
|             |                      | 0.    | 0.    | 0.    | 3658. | 4694.  | 6046.  | 5819.  | 0.     | 0.     | 0.    | 10104. |      |    |
| 3           | GROUP TECH/PARTS CLS | 0.    | 0.    | 180.  | 160.  | 285.   | 125.   | 0.     | 0.     | 0.     | 0.    | 750.   | 24.  | 10 |
|             |                      | 0.    | 0.    | 0.    | 0.    | 1840.  | 3543.  | 6552.  | 6007.  | 0.     | 0.    | 17942. | 12.  |    |
|             |                      | 0.    | 0.    | 0.    | 0.    | 1840.  | 3543.  | 6552.  | 6007.  | 0.     | 0.    | 8971.  |      |    |
| 24          | ION IMPLANTION DN444 | 0.    | 0.    | 230.  | 100.  | 250.   | 0.     | 0.     | 0.     | 0.     | 0.    | 580.   | 18.  | 3  |
|             |                      | 0.    | 0.    | 0.    | 0.    | 1520.  | 3239.  | 2879.  | 2617.  | 0.     | 0.    | 10255. | 12.  |    |
|             |                      | 0.    | 0.    | 0.    | 0.    | 1520.  | 3239.  | 2879.  | 2617.  | 0.     | 0.    | 7178.  |      |    |
| 51          | COMP SHOP INSTRUCT   | 0.    | 0.    | 200.  | 0.    | 0.     | 0.     | 0.     | 0.     | 0.     | 0.    | 200.   | 40.  | 10 |
|             |                      | 0.    | 0.    | 0.    | 2305. | 2096.  | 1905.  | 1732.  | 0.     | 0.     | 0.    | 8018.  | 28.  |    |
|             |                      | 0.    | 0.    | 0.    | 2305. | 2096.  | 1905.  | 1732.  | 0.     | 0.     | 0.    | 5627.  |      |    |
| 13          | AUTO-HY8 ASMBLY      | 0.    | 0.    | 120.  | 250.  | 250.   | 0.     | 0.     | 0.     | 0.     | 0.    | 620.   | 12.  | 6  |
|             |                      | 0.    | 0.    | 0.    | 1378. | 1830.  | 2278.  | 2125.  | 0.     | 0.     | 0.    | 7610.  | 6.   |    |
|             |                      | 0.    | 0.    | 0.    | 1378. | 1830.  | 2278.  | 2125.  | 0.     | 0.     | 0.    | 3805.  |      |    |
| 21          | EL BM LSI CIR DN4415 | 0.    | 0.    | 250.  | 150.  | 200.   | 0.     | 0.     | 0.     | 0.     | 0.    | 600.   | 12.  | 3  |
|             |                      | 0.    | 0.    | 0.    | 0.    | 1188.  | 2159.  | 1963.  | 1784.  | 0.     | 0.    | 7094.  | 6.   |    |
|             |                      | 0.    | 0.    | 0.    | 0.    | 1188.  | 2159.  | 1963.  | 1784.  | 0.     | 0.    | 3547.  |      |    |
| 102         | OP.ASST.A33PBL A805  | 0.    | 0.    | 70.   | 1844. | 1677.  | 0.     | 0.     | 0.     | 0.     | 0.    | 70.    | 87.  | 8  |
|             |                      | 0.    | 0.    | 1014. | 1844. | 1677.  | 1524.  | 0.     | 0.     | 0.     | 0.    | 6059.  | 65.  |    |
|             |                      | 0.    | 0.    | 1014. | 1844. | 1677.  | 1524.  | 0.     | 0.     | 0.     | 0.    | 4544.  |      |    |
| 56          | AUTOCBLEARNESS AS30  | 0.    | 0.    | 350.  | 200.  | 0.     | 0.     | 0.     | 0.     | 0.     | 0.    | 550.   | 8.   | 1  |
|             |                      | 0.    | 0.    | 0.    | 0.    | 699.   | 1270.  | 1155.  | 1050.  | 0.     | 0.    | 4173.  | 6.   |    |
|             |                      | 0.    | 0.    | 0.    | 0.    | 699.   | 1270.  | 1155.  | 1050.  | 0.     | 0.    | 3130.  |      |    |
| 9           | VAPOR SOLDERING      | 0.    | 0.    | 60.   | 50.   | 0.     | 0.     | 0.     | 0.     | 0.     | 0.    | 110.   | 33.  | 1  |
|             |                      | 0.    | 0.    | 0.    | 610.  | 1043.  | 1008.  | 970.   | 0.     | 0.     | 0.    | 3630.  | 30.  |    |
|             |                      | 0.    | 0.    | 0.    | 610.  | 1043.  | 1008.  | 970.   | 0.     | 0.     | 0.    | 3267.  |      |    |
| 57          | N/C CBL HARNESS AR09 | 0.    | 0.    | 200.  | 500.  | 200.   | 0.     | 0.     | 0.     | 0.     | 0.    | 900.   | 5.   | 1  |
|             |                      | 0.    | 0.    | 0.    | 0.    | 699.   | 1270.  | 1155.  | 1050.  | 0.     | 0.    | 4173.  | 3.   |    |
|             |                      | 0.    | 0.    | 0.    | 0.    | 699.   | 1270.  | 1155.  | 1050.  | 0.     | 0.    | 3130.  |      |    |



## ----- MANUFACTURING TECHNOLOGY STUDY --- 06/07/77 -----

## METHOD OF COST SAVING - 3 MANUFACTURING METHOD

PROJECT COST (\$, THOUSANDS)  
 ANTICIPATED SAVINGS (\$, THOUSANDS) - UPPER BOUND  
 LOWER BOUND  
 (ALL FIGURES IN FY 78 DOLLARS)

| PROJ<br>NO. | PROJECT TITLE        | FY 78 | FY 79 | FY 80 | FY 81 | FY 82  | FY 83  | FY 84  | FY 85  | FY 86  | FY 87 | TOTAL  | 3/1  | X  |
|-------------|----------------------|-------|-------|-------|-------|--------|--------|--------|--------|--------|-------|--------|------|----|
| 59          | PCB OCR INSP. A266   | 0.    | 0.    | 200.  | 300.  | 300.   | 0.     | 0.     | 0.     | 0.     | 0.    | 800.   | 72.  | 11 |
|             |                      | 0.    | 0.    | 0.    | 0.    | 0.     | 16731. | 15272. | 13491. | 11807. |       | 57301. | 57.  |    |
|             |                      | 0.    | 0.    | 0.    | 0.    | 0.     | 16731. | 15272. | 13491. | 11807. |       | 45841. |      |    |
| 61          | TEST OPTM MODEL A213 | 0.    | 0.    | 150.  | 200.  | 0.     | 0.     | 0.     | 0.     | 0.     | 0.    | 350.   | 152. | 11 |
|             |                      | 0.    | 0.    | 0.    | 0.    | 7861.  | 16731. | 15272. | 13491. |        |       | 53352. | 114. |    |
|             |                      | 0.    | 0.    | 0.    | 0.    | 7861.  | 16731. | 15272. | 13491. |        |       | 40016. |      |    |
| 85          | FBR-OPT INT STR A311 | 0.    | 0.    | 250.  | 250.  | 0.     | 0.     | 0.     | 0.     | 0.     | 0.    | 500.   | 96.  | 1  |
|             |                      | 0.    | 0.    | 0.    | 7658. | 12667. | 14563. | 13317. |        |        |       | 48205. | 48.  |    |
|             |                      | 0.    | 0.    | 0.    | 7658. | 12667. | 14563. | 13317. |        |        |       | 24103. |      |    |
| 52          | ELEC CONNECPLATEA502 | 0.    | 0.    | 150.  | 200.  | 0.     | 0.     | 0.     | 0.     | 0.     | 0.    | 350.   | 102. | 1  |
|             |                      | 0.    | 0.    | 0.    | 5750. | 9826.  | 10457. | 9545.  |        |        |       | 35578. | 76.  |    |
|             |                      | 0.    | 0.    | 0.    | 5750. | 9826.  | 10457. | 9545.  |        |        |       | 26683. |      |    |
| 50          | AUTO WIRE SYS        | 0.    | 0.    | 500.  | 1000. | 1000.  | 0.     | 0.     | 0.     | 0.     | 0.    | 2500.  | 13.  | 8  |
|             |                      | 0.    | 0.    | 0.    | 0.    | 4191.  | 7620.  | 10392. | 9447.  |        |       | 31650. | 9.   |    |
|             |                      | 0.    | 0.    | 0.    | 0.    | 4191.  | 7620.  | 10392. | 9447.  |        |       | 22155. |      |    |
| 87          | PLAS HV CAB8 A773    | 0.    | 0.    | 150.  | 150.  | 0.     | 0.     | 0.     | 0.     | 0.     | 0.    | 300.   | 77.  | 1  |
|             |                      | 0.    | 0.    | 0.    | 3842. | 6985.  | 6350.  | 5773.  |        |        |       | 22951. | 69.  |    |
|             |                      | 0.    | 0.    | 0.    | 3842. | 6985.  | 6350.  | 5773.  |        |        |       | 20656. |      |    |
| 23          | THINSLAYRTEC DNA566  | 0.    | 0.    | 550.  | 400.  | 150.   | 0.     | 0.     | 0.     | 0.     | 0.    | 1100.  | 19.  | 3  |
|             |                      | 0.    | 0.    | 0.    | 0.    | 2945.  | 6477.  | 5810.  | 5282.  |        |       | 20514. | 13.  |    |
|             |                      | 0.    | 0.    | 0.    | 0.    | 2945.  | 6477.  | 5810.  | 5282.  |        |       | 14065. |      |    |
| 101         | CL.CR.CL.PCB A887    | 0.    | 0.    | 95.   | 0.    | 0.     | 0.     | 0.     | 0.     | 0.     | 0.    | 95.    | 197. | 4  |
|             |                      | 0.    | 0.    | 3570. | 5410. | 4620.  | 5080.  |        |        |        |       | 18680. | 169. |    |
|             |                      | 0.    | 0.    | 3570. | 5410. | 4620.  | 5080.  |        |        |        |       | 16098. |      |    |
| 86          | GLUE AV-CHASIS A802  | 0.    | 0.    | 100.  | 0.    | 0.     | 0.     | 0.     | 0.     | 0.     | 0.    | 100.   | 151. | 1  |
|             |                      | 0.    | 0.    | 2029. | 4610. | 3726.  | 4763.  |        |        |        |       | 15127. | 136. |    |
|             |                      | 0.    | 0.    | 2029. | 4610. | 3726.  | 4763.  |        |        |        |       | 13615. |      |    |
| 43          | L3HYBRID ASSY A116A  | 0.    | 0.    | 150.  | 150.  | 0.     | 0.     | 0.     | 0.     | 0.     | 0.    | 300.   | 50.  | 6  |
|             |                      | 0.    | 0.    | 0.    | 0.    | 2096.  | 6350.  | 3464.  | 3149.  |        |       | 15059. | 35.  |    |
|             |                      | 0.    | 0.    | 0.    | 0.    | 2096.  | 6350.  | 3464.  | 3149.  |        |       | 10541. |      |    |
| 54          | WATERSOLFLUXSOL A862 | 0.    | 0.    | 300.  | 150.  | 0.     | 0.     | 0.     | 0.     | 0.     | 0.    | 450.   | 28.  | 4  |
|             |                      | 0.    | 0.    | 0.    | 0.    | 1887.  | 4015.  | 3665.  | 3238.  |        |       | 12805. | 24.  |    |
|             |                      | 0.    | 0.    | 0.    | 0.    | 1887.  | 4015.  | 3665.  | 3238.  |        |       | 10601. |      |    |
| 65          | RIBBON SAPPHIRE      | 0.    | 0.    | 250.  | 250.  | 0.     | 0.     | 0.     | 0.     | 0.     | 0.    | 750.   | 17.  | 3  |
|             |                      | 0.    | 0.    | 0.    | 0.    | 0.     | 2159.  | 3926.  | 3569.  |        |       | 12898. | 9.   |    |
|             |                      | 0.    | 0.    | 0.    | 0.    | 0.     | 2159.  | 3926.  | 3569.  |        |       | 6449.  |      |    |
| 70          | LASER WELDING CABINT | 0.    | 0.    | 300.  | 200.  | 0.     | 0.     | 0.     | 0.     | 0.     | 0.    | 500.   | 22.  | 1  |
|             |                      | 0.    | 0.    | 0.    | 0.    | 2445.  | 3175.  | 2887.  | 2624.  |        |       | 11131. | 16.  |    |
|             |                      | 0.    | 0.    | 0.    | 0.    | 2445.  | 3175.  | 2887.  | 2624.  |        |       | 7792.  |      |    |



| QTY | DESCRIPTION           | UNIT | PRICE | TOTAL | TAX | NET | DISC | DATE | STATUS |
|-----|-----------------------|------|-------|-------|-----|-----|------|------|--------|
| 65  | RIBBON SAPPHIRE       |      | 0.    | 0.    | 0.  | 0.  | 0.   | 0.   | 0.     |
| 70  | LASER WELDING CABINET |      | 0.    | 0.    | 0.  | 0.  | 0.   | 0.   | 0.     |
| 30  | SUB AU PN PLATE A501  |      | 0.    | 0.    | 0.  | 0.  | 0.   | 0.   | 0.     |
| 53  | MECH FLEXRG PCB A840  |      | 0.    | 0.    | 0.  | 0.  | 0.   | 0.   | 0.     |
| 35  | ULTRATHIN MICROC A72  |      | 0.    | 0.    | 0.  | 0.  | 0.   | 0.   | 0.     |
| 16  | HYBRD LAS BAD DN4579  |      | 0.    | 0.    | 0.  | 0.  | 0.   | 0.   | 0.     |
| 17  | IONRESISTTRIM DN4577  |      | 0.    | 0.    | 0.  | 0.  | 0.   | 0.   | 0.     |
| 98  | CHOS/SOS MANU A1258   |      | 0.    | 0.    | 0.  | 0.  | 0.   | 0.   | 0.     |
| 5   | PCB SHEAR FREE HOLES  |      | 0.    | 0.    | 0.  | 0.  | 0.   | 0.   | 0.     |
| 77  | AV.NC MACH CONTROL    |      | 0.    | 0.    | 0.  | 0.  | 0.   | 0.   | 0.     |
| 69  | PLASTIC MICROWV COMP  |      | 0.    | 0.    | 0.  | 0.  | 0.   | 0.   | 0.     |
| 26  | PCB ELCHEM-ETCH A832  |      | 0.    | 0.    | 0.  | 0.  | 0.   | 0.   | 0.     |
| 36  | LIGHTMT RF STRIPLINE  |      | 0.    | 0.    | 0.  | 0.  | 0.   | 0.   | 0.     |
| 79  | SLK SCRN PRNTNG PCB83 |      | 0.    | 0.    | 0.  | 0.  | 0.   | 0.   | 0.     |
| 55  | SHEARFREEPCB A836     |      | 0.    | 0.    | 0.  | 0.  | 0.   | 0.   | 0.     |
| 56  | AUTOCBLEARNERS A830   |      | 0.    | 0.    | 0.  | 0.  | 0.   | 0.   | 0.     |
| 68  | HYBRID SEAL RINGS     |      | 0.    | 0.    | 0.  | 0.  | 0.   | 0.   | 0.     |
| 9   | VAPOR SOLDERING       |      | 0.    | 0.    | 0.  | 0.  | 0.   | 0.   | 0.     |
| 1   | PCB METAL CORE        |      | 0.    | 0.    | 0.  | 0.  | 0.   | 0.   | 0.     |

[illegible]





METHOD OF COST SAVING - 4 INSTITUTIONAL

PROJECT COST (\$, THOUSANDS)  
ANTICIPATED SAVINGS (\$, THOUSANDS) - UPPER BOUND  
LOWER BOUND  
(ALL FIGURES IN FY 78 DOLLARS)

| PROJ<br>NO. | PROJECT TITLE          | FY 78 | FY 79 | FY 80 | FY 81 | FY 82 | FY 83  | FY 84 | FY 85 | FY 86 | FY 87 | TOTAL  | S/I | X |
|-------------|------------------------|-------|-------|-------|-------|-------|--------|-------|-------|-------|-------|--------|-----|---|
| 4           | SOLDER SPC. PLACE      | 0.    | 0.    | 350.  | 350.  | 0.    | 0.     | 0.    | 0.    | 0.    | 0.    | 700.   | 27. | 8 |
|             |                        | 0.    | 0.    | 0.    | 3356. | 4417. | 5668.  | 5242. |       |       |       | 18882. | 21. |   |
|             |                        | 0.    | 0.    | 0.    | 3356. | 4417. | 5668.  | 5242. |       |       |       | 14809. |     |   |
| 72          | TECH SH. COURSE        | 0.    | 0.    | 600.  | 1000. | 0.    | 0.     | 0.    | 0.    | 0.    | 0.    | 1600.  |     | 8 |
|             |                        | 0.    | 0.    | 0.    | 1463. | 1878. | 1814.  | 1746. |       |       |       | 6900.  | 4.  |   |
|             |                        | 0.    | 0.    | 0.    | 1463. | 1878. | 1814.  | 1746. |       |       |       | 3450.  | 2.  |   |
| 63          | MOS RAD MRD 1ST A231   | 0.    | 0.    | 200.  | 100.  | 0.    | 0.     | 0.    | 0.    | 0.    | 0.    | 300.   | 10. | 3 |
|             |                        | 0.    | 0.    | 0.    | 523.  | 950.  | 864.   | 785.  |       |       |       | 3121.  | 9.  |   |
|             |                        | 0.    | 0.    | 0.    | 523.  | 950.  | 864.   | 785.  |       |       |       | 2653.  |     |   |
| 8           | REWORK STD MYB CIR     | 0.    | 0.    | 200.  | 200.  | 200.  | 0.     | 0.    | 0.    | 0.    | 0.    | 600.   | 6.  | 6 |
|             |                        | 0.    | 0.    | 0.    | 610.  | 782.  | 1008.  | 970.  |       |       |       | 3369.  | 4.  |   |
|             |                        | 0.    | 0.    | 0.    | 610.  | 782.  | 1008.  | 970.  |       |       |       | 2527.  |     |   |
| 81          | STD. AUTOM. INTERFACES | 0.    | 0.    | 50.   | 50.   | 50.   | 0.     | 0.    | 0.    | 0.    | 0.    | 150.   | 18. | 8 |
|             |                        | 0.    | 0.    | 0.    | 461.  | 838.  | 762.   | 693.  |       |       |       | 2754.  | 17. |   |
|             |                        | 0.    | 0.    | 0.    | 461.  | 838.  | 762.   | 693.  |       |       |       | 2479.  |     |   |
|             | INVESTMENT TOTAL       | 0.    | 0.    | 1400. | 1700. | 2504. | 0.     | 0.    | 0.    | 0.    | 0.    | 3350.  |     |   |
|             | SAVINGS TOTAL (U)      | 0.    | 0.    | 0.    | 6412. | 8865. | 10115. | 9437. |       |       |       | 34827. | 10. |   |
|             | SAVINGS TOTAL (L)      | 0.    | 0.    | 0.    | 3726. | 6400. | 8184.  | 7603. |       |       |       | 25918. | 8.  |   |

TABLE 4

Table 4

| PROJECT - 1 PCB METAL CORE System |      | Due to MT Program               |  |
|-----------------------------------|------|---------------------------------|--|
| AFFECTED NAVY WEAPON SYSTEM       | YEAR | Acquisition Cost (\$ THOUSANDS) | SAVINGS (\$ THOUSANDS) (UPPER) (LOWER) |
| -----                             |      |                                 |  |
| HARPOON                           | 1    | 141700.0                        | 0.0                                    |
|                                   | 2    | 162000.0                        | 0.0                                    |
|                                   | 3    | 156200.0                        | 0.0                                    |
|                                   | 4    | 156300.0                        | 13.4                                   |
|                                   | 5    | 156400.0                        | 32.2                                   |
|                                   | 6    | 41700.0                         | 7.5                                    |
|                                   | 7    | 43400.0                         | 18.8                                   |
|                                   | 8    | 45100.0                         | 17.1                                   |
|                                   | 9    | 46900.0                         |  |
|                                   | 10   | 48800.0                         | 6.8                                    |
| TOTAL                             |      | 996500.0                        | 162.3                                  |
|                                   |      |                                 | 64.9                                   |
| -----                             |      |                                 |  |
| STANDARD ER (SP-2)                | 1    | 37800.0                         | 0.0                                    |
|                                   | 2    | 39800.0                         | 0.0                                    |
|                                   | 3    | 45300.0                         | 0.0                                    |
|                                   | 4    | 141200.0                        | 31.2                                   |
|                                   | 5    | 144400.0                        | 55.7                                   |
|                                   | 6    | 100100.0                        | 33.8                                   |
|                                   | 7    | 104100.0                        | 30.7                                   |
|                                   | 8    | 108300.0                        |  |
|                                   | 9    | 112600.0                        |  |
|                                   | 10   | 117100.0                        |  |
| TOTAL                             |      | 950700.0                        | 201.8                                  |
|                                   |      |                                 | 151.3                                  |
| -----                             |      |                                 |  |
| STANDARD MR                       | 1    | 91200.0                         | 0.0                                    |
|                                   | 2    | 82600.0                         | 0.0                                    |
|                                   | 3    | 88600.0                         | 0.0                                    |
|                                   | 4    | 93900.0                         | 20.7                                   |
|                                   | 5    | 98700.0                         | 38.1                                   |
|                                   | 6    | 100500.0                        | 33.9                                   |
|                                   | 7    | 105200.0                        | 31.0                                   |
|                                   | 8    | 108700.0                        |  |
|                                   | 9    | 113800.0                        |  |
|                                   | 10   | 117600.0                        |  |
| TOTAL                             |      | 1000800.0                       | 165.0                                  |
|                                   |      |                                 | 123.7                                  |
| -----                             |      |                                 |  |
| SPARROW                           | 1    | 45600.0                         | 0.0                                    |
|                                   | 2    | 48400.0                         | 0.0                                    |
|                                   | 3    | 82700.0                         | 0.0                                    |
|                                   | 4    | 82200.0                         | 18.1                                   |
|                                   | 5    | 84100.0                         | 32.4                                   |
|                                   | 6    | 32700.0                         | 11.0                                   |
|                                   | 7    | 34500.0                         | 10.2                                   |
|                                   | 8    | 35400.0                         |  |
|                                   | 9    | 37300.0                         |  |
|                                   | 10   | 38300.0                         |  |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.



|       |          |      |      |
|-------|----------|------|------|
| 1     | 82700.0  | 0.0  | 0.0  |
| 2     | 82200.0  | 24.2 | 18.1 |
| 3     | 84100.0  | 43.3 | 32.4 |
| 4     | 32700.0  | 14.7 | 11.0 |
| 5     | 30500.0  | 13.6 | 10.2 |
| 6     | 35400.0  |      |      |
| 7     | 37300.0  |      |      |
| 8     | 30300.0  |      |      |
| 9     |          |      |      |
| 10    |          |      |      |
| TOTAL | 521200.0 | 95.7 | 71.0 |

|       |          |       |      |
|-------|----------|-------|------|
| 1     | 0.0      | 0.0   | 0.0  |
| 2     | 30300.0  | 0.0   | 0.0  |
| 3     | 52800.0  | 0.0   | 0.0  |
| 4     | 75100.0  | 22.1  | 0.0  |
| 5     | 123800.0 | 63.7  | 25.5 |
| 6     | 30500.0  | 13.7  | 5.5  |
| 7     | 31800.0  | 12.5  | 5.0  |
| 8     | 32900.0  |       |      |
| 9     | 34300.0  |       |      |
| 10    | 35600.0  |       |      |
| TOTAL | 447100.0 | 112.0 | 44.8 |

|       |           |       |       |
|-------|-----------|-------|-------|
| 1     | 8300.0    | 0.0   | 0.0   |
| 2     | 165600.0  | 0.0   | 0.0   |
| 3     | 222800.0  | 0.0   | 0.0   |
| 4     | 217300.0  | 63.9  | 48.0  |
| 5     | 221000.0  | 113.7 | 85.3  |
| 6     | 190550.0  | 85.7  | 64.3  |
| 7     | 190640.0  | 74.9  | 56.2  |
| 8     | 190580.0  |       |       |
| 9     | 80820.0   |       |       |
| 10    | 2140.0    |       |       |
| TOTAL | 1469730.0 | 338.3 | 253.7 |

| PROJECT TITLE  | YEAR | MT PROJECT COST (\$ THOUSANDS) | NET GAIN (\$ THOUSANDS) (UPPER) | NET GAIN (\$ THOUSANDS) (LOWER) |
|----------------|------|--------------------------------|---------------------------------|---------------------------------|
| PCB METAL CORE | 1    | 0.0                            | 0.0                             | 0.0                             |
|                | 2    | 0.0                            | 0.0                             | 0.0                             |
|                | 3    | 85.0                           | -85.0                           | -85.0                           |
|                | 4    | 100.0                          | 125.4                           | 45.2                            |
|                | 5    | 0.0                            | 426.2                           | 269.2                           |
|                | 6    | 0.0                            | 223.1                           | 155.9                           |
|                | 7    | 0.0                            | 200.3                           | 139.9                           |
|                | 8    | 0.0                            |                                 |                                 |
|                | 9    | 0.0                            |                                 |                                 |
|                | 10   | 0.0                            |                                 |                                 |
| TOTAL          |      | 185.0                          | 890.0                           | 525.2                           |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

MANUFACTURING TECHNOLOGY STUDY --- 06/07/77 -----

PROJECT - 2 PCB CONFORM COATING

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|------|-------------------------------|-----------------------------------|-----------------------------------|
| HARPOON                        |      |                               |                                   |                                   |
|                                | 1    | 141700.0                      | 0.0                               | 0.0                               |
|                                | 2    | 162000.0                      | 0.0                               | 0.0                               |
|                                | 3    | 156200.0                      | 0.0                               | 0.0                               |
|                                | 4    | 156300.0                      | 0.0                               | 0.0                               |
|                                | 5    | 156400.0                      | 0.0                               | 5.6                               |
|                                | 6    | 41700.0                       | 3.1                               | 2.5                               |
|                                | 7    | 43400.0                       | 2.8                               | 2.3                               |
|                                | 8    | 45100.0                       | 2.6                               | 2.1                               |
|                                | 9    | 46900.0                       |                                   |                                   |
|                                | 10   | 48800.0                       |                                   |                                   |
| TOTAL                          |      | 998500.0                      | 16.6                              | 12.5                              |

|                    |    |          |      |      |
|--------------------|----|----------|------|------|
| STANDARD ER (SM-2) |    |          |      |      |
|                    | 1  | 37800.0  | 0.0  | 0.0  |
|                    | 2  | 39800.0  | 0.0  | 0.0  |
|                    | 3  | 45300.0  | 0.0  | 0.0  |
|                    | 4  | 141200.0 | 2.8  | 1.9  |
|                    | 5  | 144400.0 | 5.0  | 4.0  |
|                    | 6  | 100100.0 | 3.0  | 2.4  |
|                    | 7  | 104100.0 | 2.7  | 2.2  |
|                    | 8  | 104300.0 |      |      |
|                    | 9  | 112600.0 |      |      |
|                    | 10 | 117100.0 |      |      |
| TOTAL              |    | 950700.0 | 13.5 | 10.5 |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

|             |    |           |      |      |
|-------------|----|-----------|------|------|
| STANDARD MR |    |           |      |      |
|             | 1  | 91200.0   | 0.0  | 0.0  |
|             | 2  | 82600.0   | 0.0  | 0.0  |
|             | 3  | 88600.0   | 0.0  | 0.0  |
|             | 4  | 93900.0   | 16.6 | 11.6 |
|             | 5  | 98700.0   | 28.8 | 23.0 |
|             | 6  | 100500.0  | 25.6 | 20.5 |
|             | 7  | 105200.0  | 23.4 | 18.7 |
|             | 8  | 108700.0  |      |      |
|             | 9  | 113600.0  |      |      |
|             | 10 | 117600.0  |      |      |
| TOTAL       |    | 1000600.0 | 94.4 | 73.9 |

|         |    |         |      |      |
|---------|----|---------|------|------|
| SPARROW |    |         |      |      |
|         | 1  | 45600.0 | 0.0  | 0.0  |
|         | 2  | 48400.0 | 0.0  | 0.0  |
|         | 3  | 82700.0 | 0.0  | 0.0  |
|         | 4  | 82200.0 | 17.7 | 12.4 |
|         | 5  | 84100.0 | 31.7 | 25.4 |
|         | 6  | 32700.0 | 10.8 | 6.6  |
|         | 7  | 34500.0 | 9.9  | 6.0  |
|         | 8  | 35400.0 |      |      |
|         | 9  | 37300.0 |      |      |
|         | 10 | 38300.0 |      |      |

0.0  
17.0  
31.7  
10.0  
9.9  
0.0

82700.0  
82200.0  
84100.0  
32700.0  
34500.0  
35400.0  
37300.0  
38300.0

54.4

70.2

521200.0

TOTAL

0.0  
0.0  
0.0  
0.0  
4.2  
1.8  
1.7  
1.5  
1.2

0.0  
30300.0  
52800.0  
75100.0  
123800.0  
30500.0  
31800.0  
32900.0  
34300.0  
35600.0

7.0

9.2

447100.0

TOTAL

0.0  
0.0  
0.0  
0.0  
2.7  
4.6  
4.0  
3.5

8300.0  
165600.0  
222800.0  
217300.0  
221000.0  
190550.0  
190640.0  
190580.0  
80820.0  
2140.0

14.7

18.9

1489730.0

TOTAL

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

NET GAIN (\$,THOUSANDS)  
(UPPER)

PROJECT COST  
(\$,THOUSANDS)

YEAR

PROJECT TITLE

0.0  
0.0  
-115.0  
-62.9  
61.5  
50.1  
45.6  
8.5

0.0  
0.0  
115.0  
100.0  
0.0  
0.0  
0.0  
0.0  
0.0  
0.0

PCB CONFORM COATING  
1  
2  
3  
4  
5  
6  
7  
8  
9  
10

-42.1

7.7

215.0

TOTAL



## MANUFACTURING TECHNOLOGY STUDY "J-2" 08/07/77

## PROJECT - 5 PCB SHEAR FREE HOLES

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR  | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|-------|-------------------------------|-----------------------------------|-----------------------------------|
| HARPOON                        |       |                               |                                   |                                   |
|                                | 1     | 141700.0                      | 0.0                               | 0.0                               |
|                                | 2     | 162000.0                      | 0.0                               | 0.0                               |
|                                | 3     | 156200.0                      | 0.0                               | 0.0                               |
|                                | 4     | 156300.0                      | 0.0                               | 0.0                               |
|                                | 5     | 156400.0                      | 67.0                              | 40.2                              |
|                                | 6     | 41700.0                       | 31.3                              | 18.8                              |
|                                | 7     | 43400.0                       | 28.4                              | 17.1                              |
|                                | 8     | 45100.0                       | 25.8                              | 15.5                              |
|                                | 9     | 46900.0                       |                                   |                                   |
|                                | 10    | 48800.0                       |                                   |                                   |
|                                | TOTAL | 998500.0                      | 152.6                             | 91.5                              |

|                    |       |          |       |       |
|--------------------|-------|----------|-------|-------|
| STANDARD ER (SM-2) |       |          |       |       |
|                    | 1     | 37800.0  | 0.0   | 0.0   |
|                    | 2     | 39800.0  | 0.0   | 0.0   |
|                    | 3     | 45300.0  | 0.0   | 0.0   |
|                    | 4     | 141200.0 | 69.2  | 41.5  |
|                    | 5     | 144400.0 | 123.8 | 74.3  |
|                    | 6     | 100100.0 | 75.0  | 45.0  |
|                    | 7     | 104100.0 | 68.2  | 40.9  |
|                    | 8     | 108300.0 |       |       |
|                    | 9     | 112600.0 |       |       |
|                    | 10    | 117100.0 |       |       |
|                    | TOTAL | 950700.0 | 336.3 | 201.8 |

Note: For comparison purposes all MT  
project savings are terminated after  
four years. In most cases successful  
projects will produce additional  
savings.

|             |       |           |       |       |
|-------------|-------|-----------|-------|-------|
| STANDARD MR |       |           |       |       |
|             | 1     | 91200.0   | 0.0   | 0.0   |
|             | 2     | 82600.0   | 0.0   | 0.0   |
|             | 3     | 88600.0   | 0.0   | 0.0   |
|             | 4     | 93900.0   | 46.1  | 27.6  |
|             | 5     | 98700.0   | 84.6  | 50.8  |
|             | 6     | 100500.0  | 75.3  | 45.2  |
|             | 7     | 105200.0  | 68.9  | 41.4  |
|             | 8     | 108700.0  |       |       |
|             | 9     | 113800.0  |       |       |
|             | 10    | 117600.0  |       |       |
|             | TOTAL | 1000800.0 | 274.9 | 165.0 |

|         |    |         |      |      |
|---------|----|---------|------|------|
| SPARROW |    |         |      |      |
|         | 1  | 45600.0 | 0.0  | 0.0  |
|         | 2  | 48400.0 | 0.0  | 0.0  |
|         | 3  | 82700.0 | 0.0  | 0.0  |
|         | 4  | 62200.0 | 40.3 | 24.2 |
|         | 5  | 64100.0 | 72.1 | 43.3 |
|         | 6  | 32700.0 | 24.5 | 14.7 |
|         | 7  | 34500.0 | 22.6 | 13.6 |
|         | 8  | 35400.0 |      |      |
|         | 9  | 37300.0 |      |      |
|         | 10 | 38300.0 |      |      |

|       |          |       |      |
|-------|----------|-------|------|
| 1     | 0.0      | 0.0   | 0.0  |
| 2     | 0.0      | 0.0   | 0.0  |
| 3     | 0.0      | 0.0   | 0.0  |
| 4     | 0.0      | 0.0   | 0.0  |
| 5     | 0.0      | 0.0   | 0.0  |
| 6     | 0.0      | 0.0   | 0.0  |
| 7     | 0.0      | 0.0   | 0.0  |
| 8     | 0.0      | 0.0   | 0.0  |
| 9     | 0.0      | 0.0   | 0.0  |
| 10    | 0.0      | 0.0   | 0.0  |
| TOTAL | 521200.0 | 159.5 | 95.7 |

|       |    |          |       |      |
|-------|----|----------|-------|------|
| HARM  | 1  | 0.0      | 0.0   | 0.0  |
|       | 2  | 30300.0  | 0.0   | 0.0  |
|       | 3  | 52800.0  | 0.0   | 0.0  |
|       | 4  | 75100.0  | 0.0   | 0.0  |
|       | 5  | 123800.0 | 53.1  | 31.8 |
|       | 6  | 30500.0  | 22.9  | 13.7 |
|       | 7  | 31800.0  | 20.8  | 12.5 |
|       | 8  | 32900.0  | 18.8  | 11.3 |
|       | 9  | 34300.0  |       |      |
|       | 10 | 35600.0  |       |      |
| TOTAL |    | 447100.0 | 115.6 | 69.4 |

|               |    |           |       |       |
|---------------|----|-----------|-------|-------|
| TOMAHAWK SLCM | 1  | 8300.0    | 0.0   | 0.0   |
|               | 2  | 165600.0  | 0.0   | 0.0   |
|               | 3  | 222800.0  | 0.0   | 0.0   |
|               | 4  | 217300.0  | 106.6 | 63.9  |
|               | 5  | 221000.0  | 189.5 | 113.7 |
|               | 6  | 190550.0  | 142.8 | 85.7  |
|               | 7  | 196640.0  | 124.9 | 74.9  |
|               | 8  | 190580.0  |       |       |
|               | 9  | 80820.0   |       |       |
|               | 10 | 2140.0    |       |       |
| TOTAL         |    | 1489730.0 | 563.8 | 338.3 |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

|                   |    |          |       |       |
|-------------------|----|----------|-------|-------|
| HK15 PHALANX CINS | 1  | 67200.0  | 0.0   | 0.0   |
|                   | 2  | 93800.0  | 0.0   | 0.0   |
|                   | 3  | 85500.0  | 0.0   | 0.0   |
|                   | 4  | 89600.0  | 52.3  | 31.4  |
|                   | 5  | 107000.0 | 109.2 | 65.5  |
|                   | 6  | 111280.0 | 99.3  | 59.6  |
|                   | 7  | 95310.0  | 74.3  | 44.6  |
|                   | 8  | 0.0      |       |       |
|                   | 9  | 0.0      |       |       |
|                   | 10 | 0.0      |       |       |
| TOTAL             |    | 649690.0 | 335.1 | 201.1 |

| PROJECT TITLE        | YEAR | PROJECT COST (\$ THOUSANDS) | NET GAIN (\$ THOUSANDS) (UPPER) | NET GAIN (\$ THOUSANDS) (LOWER) |
|----------------------|------|-----------------------------|---------------------------------|---------------------------------|
| PCB SHEAR FREE HOLES | 1    | 0.0                         | 0.0                             | 0.0                             |
|                      | 2    | 0.0                         | 0.0                             | 0.0                             |
|                      | 3    | 90.0                        | -90.0                           | -90.0                           |
|                      | 4    | 60.0                        | 254.5                           | 128.7                           |
|                      | 5    |                             | 699.4                           | 419.6                           |
|                      | 6    |                             | 471.1                           | 282.6                           |
|                      | 7    |                             | 408.2                           | 244.9                           |
|                      | 8    | 0.0                         | 48.7                            | 26.8                            |
|                      | 9    | 0.0                         |                                 |                                 |
|                      | 10   | 0.0                         |                                 |                                 |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

|       |       |        |        |
|-------|-------|--------|--------|
| 1     | 90.0  | 90.0   | 90.0   |
| 2     | 254.5 | 128.7  | 128.7  |
| 3     | 699.4 | 419.6  | 419.6  |
| 4     | 471.1 | 282.6  | 282.6  |
| 5     | 408.2 | 244.9  | 244.9  |
| 6     | 44.7  | 26.8   | 26.8   |
| TOTAL | 150.0 | 1787.8 | 1012.7 |

SCIENCE APPLICATIONS, INC. MCLEAN, VA. -----



PROJECT - 6 PCB COMPUTER PLATING

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|------|-------------------------------|-----------------------------------|-----------------------------------|
| =====                          |      |                               |                                   |                                   |

|         |    |          |       |      |
|---------|----|----------|-------|------|
| HARPOON | 1  | 141700.0 | 0.0   | 0.0  |
|         | 2  | 162000.0 | 0.0   | 0.0  |
|         | 3  | 156200.0 | 0.0   | 0.0  |
|         | 4  | 156300.0 | 30.7  | 16.4 |
|         | 5  | 156400.0 | 53.6  | 32.2 |
|         | 6  | 41700.0  | 12.5  | 7.5  |
|         | 7  | 43400.0  | 11.4  | 6.8  |
|         | 8  | 45100.0  |       |      |
|         | 9  | 46900.0  |       |      |
|         | 10 | 48800.0  |       |      |
| TOTAL   |    | 998500.0 | 106.2 | 64.9 |

|                    |    |          |       |      |
|--------------------|----|----------|-------|------|
| STANDARD ER (SM-2) | 1  | 37800.0  | 0.0   | 0.0  |
|                    | 2  | 39800.0  | 0.0   | 0.0  |
|                    | 3  | 45300.0  | 0.0   | 0.0  |
|                    | 4  | 141200.0 | 27.7  | 16.6 |
|                    | 5  | 144400.0 | 49.5  | 29.7 |
|                    | 6  | 100100.0 | 30.0  | 18.0 |
|                    | 7  | 104100.0 | 27.3  | 16.4 |
|                    | 8  | 108300.0 |       |      |
|                    | 9  | 112600.0 |       |      |
|                    | 10 | 117100.0 |       |      |
| TOTAL              |    | 950700.0 | 134.5 | 80.7 |

|             |    |           |       |      |
|-------------|----|-----------|-------|------|
| STANDARD MR | 1  | 91200.0   | 0.0   | 0.0  |
|             | 2  | 82600.0   | 0.0   | 0.0  |
|             | 3  | 88600.0   | 0.0   | 0.0  |
|             | 4  | 93900.0   | 16.4  | 11.1 |
|             | 5  | 98700.0   | 33.8  | 20.3 |
|             | 6  | 100500.0  | 30.1  | 18.1 |
|             | 7  | 105200.0  | 27.6  | 16.5 |
|             | 8  | 108700.0  |       |      |
|             | 9  | 113800.0  |       |      |
|             | 10 | 117600.0  |       |      |
| TOTAL       |    | 1000800.0 | 110.0 | 66.0 |

|         |    |         |      |      |
|---------|----|---------|------|------|
| SPARROW | 1  | 45600.0 | 0.0  | 0.0  |
|         | 2  | 48400.0 | 0.0  | 0.0  |
|         | 3  | 82700.0 | 0.0  | 0.0  |
|         | 4  | 82200.0 | 16.1 | 9.7  |
|         | 5  | 84100.0 | 28.8 | 17.3 |
|         | 6  | 32700.0 | 9.8  | 5.9  |
|         | 7  | 34500.0 | 9.0  | 5.4  |
|         | 8  | 35400.0 |      |      |
|         | 9  | 37300.0 |      |      |
|         | 10 | 38100.0 |      |      |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

| PROJECT TITLE | YEAR | PROJECT COST (\$ THOUSANDS) | NET GAIN (\$ THOUSANDS) (UPPER) | NET GAIN (\$ THOUSANDS) (LOWER) |
|---------------|------|-----------------------------|---------------------------------|---------------------------------|
| MARM          | 1    | 0.0                         | 0.0                             | 0.0                             |
|               | 2    | 30300.0                     | 0.0                             | 0.0                             |
|               | 3    | 52800.0                     | 0.0                             | 0.0                             |
|               | 4    | 75100.0                     | 14.7                            | 8.8                             |
|               | 5    | 123800.0                    | 42.5                            | 25.5                            |
|               | 6    | 30500.0                     | 9.1                             | 5.5                             |
|               | 7    | 31800.0                     | 8.3                             | 5.0                             |
|               | 8    | 32900.0                     |                                 |                                 |
|               | 9    | 34300.0                     |                                 |                                 |
|               | 10   | 35600.0                     |                                 |                                 |
| TOTAL         |      | 447100.0                    | 74.7                            | 44.8                            |

| PROJECT TITLE | YEAR | PROJECT COST (\$ THOUSANDS) | NET GAIN (\$ THOUSANDS) (UPPER) | NET GAIN (\$ THOUSANDS) (LOWER) |
|---------------|------|-----------------------------|---------------------------------|---------------------------------|
| TOMAHAWK SLCF | 1    | 8300.0                      | 0.0                             | 0.0                             |
|               | 2    | 165600.0                    | 0.0                             | 0.0                             |
|               | 3    | 222800.0                    | 0.0                             | 0.0                             |
|               | 4    | 217300.0                    | 42.6                            | 25.6                            |
|               | 5    | 221000.0                    | 75.8                            | 45.5                            |
|               | 6    | 190550.0                    | 57.1                            | 34.3                            |
|               | 7    | 190640.0                    | 50.0                            | 30.0                            |
|               | 8    | 190580.0                    |                                 |                                 |
|               | 9    | 80820.0                     |                                 |                                 |
|               | 10   | 2140.0                      |                                 |                                 |
| TOTAL         |      | 1489730.0                   | 225.5                           | 135.3                           |

| PROJECT TITLE        | YEAR | PROJECT COST (\$ THOUSANDS) | NET GAIN (\$ THOUSANDS) (UPPER) | NET GAIN (\$ THOUSANDS) (LOWER) |
|----------------------|------|-----------------------------|---------------------------------|---------------------------------|
| PCB COMPUTER PLATING | 1    | 0.0                         | 0.0                             | 0.0                             |
|                      | 2    | 0.0                         | 0.0                             | 0.0                             |
|                      | 3    | 70.0                        | -70.0                           | -70.0                           |
|                      | 4    | 0.0                         | 150.3                           | 90.2                            |
|                      | 5    | 0.0                         | 284.1                           | 170.5                           |
|                      | 6    | 0.0                         | 148.7                           | 89.2                            |
|                      | 7    | 0.0                         | 133.6                           | 80.1                            |
|                      | 8    | 0.0                         |                                 |                                 |
|                      | 9    | 0.0                         |                                 |                                 |
|                      | 10   | 0.0                         |                                 |                                 |
| TOTAL                |      | 70.0                        | 646.6                           | 360.0                           |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

## ----- MANUFACTURING TECHNOLOGY STUDY ---- 06/07/77 -----

## PROJECT - 7 GANG PROBE MYB TEST

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR  | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|-------|-------------------------------|-----------------------------------|-----------------------------------|
| HARPOON                        |       |                               |                                   |                                   |
|                                | 1     | 141700.0                      | 0.0                               | 0.0                               |
|                                | 2     | 162000.0                      | 0.0                               | 0.0                               |
|                                | 3     | 156200.0                      | 0.0                               | 0.0                               |
|                                | 4     | 156300.0                      | 0.0                               | 0.0                               |
|                                | 5     | 156400.0                      | 12.6                              | 10.7                              |
|                                | 6     | 41700.0                       | 5.9                               | 5.0                               |
|                                | 7     | 43400.0                       | 5.3                               | 4.5                               |
|                                | 8     | 45100.0                       | 4.8                               | 4.1                               |
|                                | 9     | 46900.0                       |                                   |                                   |
|                                | 10    | 48800.0                       |                                   |                                   |
|                                | TOTAL | 996500.0                      | 26.6                              | 24.3                              |

|                    |       |          |      |      |
|--------------------|-------|----------|------|------|
| STANDARD ER (SM-2) |       |          |      |      |
|                    | 1     | 37800.0  | 0.0  | 0.0  |
|                    | 2     | 39800.0  | 0.0  | 0.0  |
|                    | 3     | 45300.0  | 0.0  | 0.0  |
|                    | 4     | 141200.0 | 6.1  | 5.2  |
|                    | 5     | 144400.0 | 11.6 | 9.9  |
|                    | 6     | 100100.0 | 7.0  | 6.0  |
|                    | 7     | 104100.0 | 6.4  | 5.4  |
|                    | 8     | 108300.0 |      |      |
|                    | 9     | 112600.0 |      |      |
|                    | 10    | 117100.0 |      |      |
|                    | TOTAL | 950700.0 | 31.1 | 26.4 |

|             |       |           |      |      |
|-------------|-------|-----------|------|------|
| STANDARD MR |       |           |      |      |
|             | 1     | 91200.0   | 0.0  | 0.0  |
|             | 2     | 82600.0   | 0.0  | 0.0  |
|             | 3     | 88600.0   | 0.0  | 0.0  |
|             | 4     | 93900.0   | 15.0 | 12.7 |
|             | 5     | 98700.0   | 27.5 | 23.4 |
|             | 6     | 100500.0  | 24.5 | 20.8 |
|             | 7     | 105200.0  | 22.4 | 19.0 |
|             | 8     | 108700.0  |      |      |
|             | 9     | 113800.0  |      |      |
|             | 10    | 117600.0  |      |      |
|             | TOTAL | 1000800.0 | 89.3 | 75.9 |

|         |    |         |      |      |
|---------|----|---------|------|------|
| SPARROW |    |         |      |      |
|         | 1  | 45600.0 | 0.0  | 0.0  |
|         | 2  | 48400.0 | 0.0  | 0.0  |
|         | 3  | 82700.0 | 0.0  | 0.0  |
|         | 4  | 82200.0 | 15.1 | 12.8 |
|         | 5  | 84100.0 | 27.0 | 23.0 |
|         | 6  | 32700.0 | 9.2  | 7.8  |
|         | 7  | 34500.0 | 8.5  | 7.2  |
|         | 8  | 35400.0 |      |      |
|         | 9  | 37300.0 |      |      |
|         | 10 | 38300.0 |      |      |

Note: For comparison purposes all Mt  
project savings are terminated after  
four years. In most cases successful  
projects will produce additional  
savings.



|       |          |      |      |
|-------|----------|------|------|
| 4     | 62700.0  | 0.0  | 0.0  |
| 3     | 82200.0  | 15.1 | 12.6 |
| 4     | 84100.0  | 27.0 | 23.0 |
| 5     | 32700.0  | 9.2  | 7.8  |
| 6     | 34500.0  | 8.5  | 7.2  |
| 7     | 35400.0  |      |      |
| 8     | 37300.0  |      |      |
| 9     | 38300.0  |      |      |
| 10    |          |      |      |
| TOTAL | 521200.0 | 59.8 | 50.8 |

|       |          |      |      |
|-------|----------|------|------|
| HARM  |          |      |      |
| 1     | 0.0      | 0.0  | 0.0  |
| 2     | 30300.0  | 0.0  | 0.0  |
| 3     | 52800.0  | 0.0  | 0.0  |
| 4     | 75100.0  | 0.0  | 0.0  |
| 5     | 123800.0 | 6.6  | 5.6  |
| 6     | 30500.0  | 2.9  | 2.4  |
| 7     | 31800.0  | 2.6  | 2.2  |
| 8     | 32400.0  | 2.4  | 2.0  |
| 9     | 34300.0  |      |      |
| 10    | 35600.0  |      |      |
| TOTAL | 447100.0 | 14.5 | 12.3 |

|               |           |      |      |
|---------------|-----------|------|------|
| TOMAHAWK SLCM |           |      |      |
| 1             | 8300.0    | 0.0  | 0.0  |
| 2             | 165600.0  | 0.0  | 0.0  |
| 3             | 222800.0  | 0.0  | 0.0  |
| 4             | 217300.0  | 0.0  | 0.0  |
| 5             | 221000.0  | 8.3  | 7.0  |
| 6             | 190550.0  | 14.3 | 12.1 |
| 7             | 190640.0  | 12.5 | 10.6 |
| 8             | 190580.0  | 10.9 | 9.3  |
| 9             | 80820.0   |      |      |
| 10            | 2140.0    |      |      |
| TOTAL         | 1489730.0 | 46.0 | 39.1 |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

| PROJECT TITLE       | YEAR | PROJECT COST (\$ THOUSANDS) | NET GAIN (\$ THOUSANDS)<br>(UPPER) | NET GAIN (\$ THOUSANDS)<br>(LOWER) |
|---------------------|------|-----------------------------|------------------------------------|------------------------------------|
| GANG PROBE HYB TEST | 1    | 0.0                         | 0.0                                | 0.0                                |
|                     | 2    | 0.0                         | 0.0                                | 0.0                                |
|                     | 3    | 20.0                        | -20.0                              | -20.0                              |
|                     | 4    | 20.0                        | 16.1                               | 10.7                               |
|                     | 5    | 0.0                         | 93.6                               | 79.6                               |
|                     | 6    | 0.0                         | 63.7                               | 54.1                               |
|                     | 7    | 0.0                         | 57.7                               | 49.0                               |
|                     | 8    | 0.0                         | 18.1                               | 15.4                               |
|                     | 9    | 0.0                         |                                    |                                    |
|                     | 10   | 0.0                         |                                    |                                    |
| TOTAL               |      | 40.0                        | 229.3                              | 188.9                              |

## ----- MANUFACTURING TECHNOLOGY STUDY --- 06/07/77 -----

## PROJECT - 0 REMORK STD HYB CIR

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|------|-------------------------------|-----------------------------------|-----------------------------------|
| STANDARD ER (SM-2)             | 1    | 37800.0                       | 0.0                               | 0.0                               |
|                                | 2    | 39800.0                       | 0.0                               | 0.0                               |
|                                | 3    | 45300.0                       | 0.0                               | 0.0                               |
|                                | 4    | 141200.0                      | 42.3                              | 32.5                              |
|                                | 5    | 144400.0                      | 58.0                              | 43.5                              |
|                                | 6    | 100100.0                      | 46.9                              | 35.2                              |
|                                | 7    | 104100.0                      | 42.6                              | 32.0                              |
|                                | 8    | 108300.0                      |                                   |                                   |
|                                | 9    | 112600.0                      |                                   |                                   |
|                                | 10   | 117100.0                      |                                   |                                   |
| TOTAL                          |      | 950700.0                      | 190.8                             | 143.1                             |

|             |    |           |       |       |
|-------------|----|-----------|-------|-------|
| STANDARD MR | 1  | 91200.0   | 0.0   | 0.0   |
|             | 2  | 82600.0   | 0.0   | 0.0   |
|             | 3  | 88600.0   | 0.0   | 0.0   |
|             | 4  | 93900.0   | 28.8  | 21.6  |
|             | 5  | 98700.0   | 39.7  | 29.8  |
|             | 6  | 100500.0  | 47.1  | 35.3  |
|             | 7  | 105200.0  | 43.1  | 32.3  |
|             | 8  | 108700.0  |       |       |
|             | 9  | 113800.0  |       |       |
|             | 10 | 117600.0  |       |       |
| TOTAL       |    | 1008000.0 | 158.6 | 119.0 |

Note: For comparison purposes all MT  
project savings are terminated after  
four years. In most cases successful  
projects will produce additional  
savings.

|               |    |           |       |       |
|---------------|----|-----------|-------|-------|
| TOMAHAWK SLCM | 1  | 8300.0    | 0.0   | 0.0   |
|               | 2  | 165600.0  | 0.0   | 0.0   |
|               | 3  | 222800.0  | 0.0   | 0.0   |
|               | 4  | 217300.0  | 66.6  | 50.0  |
|               | 5  | 221000.0  | 88.8  | 66.6  |
|               | 6  | 190550.0  | 89.3  | 68.9  |
|               | 7  | 190640.0  | 78.1  | 58.5  |
|               | 8  | 190580.0  |       |       |
|               | 9  | 80820.0   |       |       |
|               | 10 | 2140.0    |       |       |
| TOTAL         |    | 1489730.0 | 322.7 | 242.1 |

| PROJECT TITLE      | YEAR | PROJECT COST<br>(\$ THOUSANDS) | NET GAIN (\$ THOUSANDS)<br>(UPPER) | NET GAIN (\$ THOUSANDS)<br>(LOWER) |
|--------------------|------|--------------------------------|------------------------------------|------------------------------------|
| REMORK STD HYB CIR | 1    | 0.0                            | 0.0                                | 0.0                                |
|                    | 2    | 0.0                            | 0.0                                | 0.0                                |
|                    | 3    | 200.0                          | -200.0                             | -200.0                             |
|                    | 4    | 200.0                          | -61.3                              | -96.0                              |
|                    | 5    | 200.0                          | -13.5                              | -60.1                              |

| PROJECT TITLE      | YEAR | PROJECT COST<br>(THOUSANDS) | NET GAIN<br>(UPPER) | NET GAIN<br>(LOWER) |
|--------------------|------|-----------------------------|---------------------|---------------------|
| REWORK STD HYB CIR | 1    | 0.0                         | 0.0                 | 0.0                 |
|                    | 2    | 0.0                         | 0.0                 | 0.0                 |
|                    | 3    | 200.0                       | 0.0                 | -200.0              |
|                    | 4    | 200.0                       | -61.3               | -96.0               |
|                    | 5    | 200.0                       | -13.5               | -60.1               |
|                    | 6    | 0.0                         | 181.2               | 137.4               |
|                    | 7    | 0.0                         | 163.8               | 122.8               |
|                    | 8    | 0.0                         |                     |                     |
|                    | 9    | 0.0                         |                     |                     |
|                    | 10   | 0.0                         |                     |                     |
| TOTAL              |      | 600.0                       | 72.2                | -95.9               |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.



MANUFACTURING TECHNOLOGY STUDY --- 06/07/77

PROJECT - 9 VAPOR SOLDERING

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|------|-------------------------------|-----------------------------------|-----------------------------------|
| AVK-16 COMPUTER                | 1    | 4500.0                        | 0.0                               | 0.0                               |
|                                | 2    | 2000.0                        | 0.0                               | 0.0                               |
|                                | 3    | 16884.0                       | 0.0                               | 0.0                               |
|                                | 4    | 19130.0                       | 14.0                              | 12.6                              |
|                                | 5    | 21678.0                       | 27.7                              | 24.9                              |
|                                | 6    | 24086.0                       | 26.9                              | 24.2                              |
|                                | 7    | 23488.0                       | 22.9                              | 20.6                              |
|                                | 8    | 20710.0                       |                                   |                                   |
|                                | 9    | 21538.0                       |                                   |                                   |
|                                | 10   | 13730.0                       |                                   |                                   |
| TOTAL                          |      | 167706.0                      | 91.3                              | 82.2                              |

|         |    |          |       |       |
|---------|----|----------|-------|-------|
| MARPOON | 1  | 141700.0 | 0.0   | 0.0   |
|         | 2  | 162008.0 | 0.0   | 0.0   |
|         | 3  | 156200.0 | 0.0   | 0.0   |
|         | 4  | 156300.0 | 47.9  | 43.1  |
|         | 5  | 156400.0 | 83.6  | 75.4  |
|         | 6  | 41700.0  | 19.5  | 17.6  |
|         | 7  | 43400.0  | 17.3  | 16.0  |
|         | 8  | 45100.0  |       |       |
|         | 9  | 46900.0  |       |       |
|         | 10 | 48800.0  |       |       |
| TOTAL   |    | 998500.0 | 169.0 | 152.1 |

|                    |    |          |       |       |
|--------------------|----|----------|-------|-------|
| STANDARD ER (SM-2) | 1  | 37800.0  | 0.0   | 0.0   |
|                    | 2  | 39800.0  | 0.0   | 0.0   |
|                    | 3  | 45300.0  | 0.0   | 0.0   |
|                    | 4  | 141200.0 | 43.3  | 39.0  |
|                    | 5  | 144400.0 | 77.4  | 69.6  |
|                    | 6  | 100100.0 | 46.9  | 42.2  |
|                    | 7  | 104100.0 | 42.6  | 38.4  |
|                    | 8  | 108300.0 |       |       |
|                    | 9  | 112600.0 |       |       |
|                    | 10 | 117100.0 |       |       |
| TOTAL              |    | 950700.0 | 210.2 | 189.2 |

|             |    |          |      |      |
|-------------|----|----------|------|------|
| STANDARD MR | 1  | 91200.0  | 0.0  | 0.0  |
|             | 2  | 82600.0  | 0.0  | 0.0  |
|             | 3  | 88600.0  | 0.0  | 0.0  |
|             | 4  | 93900.0  | 28.8 | 25.9 |
|             | 5  | 98700.0  | 52.9 | 47.6 |
|             | 6  | 100500.0 | 47.1 | 42.4 |
|             | 7  | 105200.0 | 43.1 | 38.6 |
|             | 8  | 108700.0 |      |      |
|             | 9  | 113800.0 |      |      |
|             | 10 | 117600.0 |      |      |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

|       |           |       |       |
|-------|-----------|-------|-------|
| 2     | 82600.0   | 0.0   | 0.0   |
| 3     | 88600.0   | 0.0   | 0.0   |
| 4     | 93900.0   | 28.8  | 25.9  |
| 5     | 98700.0   | 52.9  | 47.6  |
| 6     | 100500.0  | 47.1  | 42.4  |
| 7     | 105200.0  | 43.1  | 36.8  |
| 8     | 108700.0  |       |       |
| 9     | 113800.0  |       |       |
| 10    | 117600.0  |       |       |
| TOTAL | 1000800.0 | 171.0 | 154.6 |

|       |          |      |      |
|-------|----------|------|------|
| 1     | 45600.0  | 0.0  | 0.0  |
| 2     | 48400.0  | 0.0  | 0.0  |
| 3     | 82700.0  | 0.0  | 0.0  |
| 4     | 82200.0  | 25.2 | 22.7 |
| 5     | 84100.0  | 45.1 | 40.6 |
| 6     | 32700.0  | 15.3 | 13.8 |
| 7     | 34500.0  | 14.1 | 12.7 |
| 8     | 35400.0  |      |      |
| 9     | 37300.0  |      |      |
| 10    | 38300.0  |      |      |
| TOTAL | 521200.0 | 99.7 | 89.7 |

|       |          |       |       |
|-------|----------|-------|-------|
| 1     | 0.0      | 0.0   | 0.0   |
| 2     | 30300.0  | 0.0   | 0.0   |
| 3     | 52800.0  | 0.0   | 0.0   |
| 4     | 75100.0  | 23.0  | 20.7  |
| 5     | 123800.0 | 66.3  | 59.7  |
| 6     | 30500.0  | 14.3  | 12.9  |
| 7     | 31800.0  | 13.0  | 11.7  |
| 8     | 32900.0  |       |       |
| 9     | 34300.0  |       |       |
| 10    | 35600.0  |       |       |
| TOTAL | 447100.0 | 116.7 | 105.0 |

|       |           |       |       |
|-------|-----------|-------|-------|
| 1     | 8300.0    | 0.0   | 0.0   |
| 2     | 165600.0  | 0.0   | 0.0   |
| 3     | 222800.0  | 0.0   | 0.0   |
| 4     | 217300.0  | 66.6  | 59.9  |
| 5     | 221000.0  | 118.4 | 106.6 |
| 6     | 190550.0  | 89.3  | 80.3  |
| 7     | 190640.0  | 78.1  | 70.3  |
| 8     | 190580.0  |       |       |
| 9     | 80820.0   |       |       |
| 10    | 2140.0    |       |       |
| TOTAL | 1489730.0 | 352.3 | 317.1 |

| PROJECT TITLE   | YEAR | PROJECT COST<br>(\$ THOUSANDS) | NET GAIN (\$ THOUSANDS)<br>(UPPER) | NET GAIN (\$ THOUSANDS)<br>(LOWER) |
|-----------------|------|--------------------------------|------------------------------------|------------------------------------|
| VAPOR SOLDERING | 1    | 0.0                            | 0.0                                | 0.0                                |
|                 | 2    | 0.0                            | 0.0                                | 0.0                                |
|                 | 3    | 60.0                           | -60.0                              | -60.0                              |
|                 | 4    | 50.0                           | 198.8                              | 173.9                              |
|                 | 5    | 0.0                            | 471.6                              | 424.4                              |
|                 | 6    | 0.0                            | 259.2                              | 233.3                              |
|                 | 7    | 0.0                            | 231.5                              | 204.4                              |
|                 | 8    | 0.0                            |                                    |                                    |
|                 | 9    | 0.0                            |                                    |                                    |
|                 | 10   | 0.0                            |                                    |                                    |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

23.9  
424.4  
233.3  
200.4

194.4  
471.6  
259.2  
231.5

50.0  
0.0  
0.0  
0.0  
0.0  
0.0  
0.0

900.0

1101.1

110.0

TOTAL

Note: For comparison purposes all MT  
project savings are terminated after  
four years. In most cases successful  
projects will produce additional  
savings.

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----- MANUFACTURING TECHNOLOGY STUDY --- 06/07/77 -----

PROJECT - 10 INTERACTIVE TESTING

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|------|-------------------------------|-----------------------------------|-----------------------------------|
| STANDARD ER (SM-2)             | 1    | 37800.0                       | 0.0                               | 0.0                               |
|                                | 2    | 39800.0                       | 0.0                               | 0.0                               |
|                                | 3    | 45300.0                       | 12.7                              | 8.9                               |
|                                | 4    | 141200.0                      | 69.2                              | 48.5                              |
|                                | 5    | 144400.0                      | 61.9                              | 43.3                              |
|                                | 6    | 100100.0                      | 37.5                              | 26.3                              |
|                                | 7    | 104100.0                      |                                   |                                   |
|                                | 8    | 108300.0                      |                                   |                                   |
|                                | 9    | 112600.0                      |                                   |                                   |
|                                | 10   | 117100.0                      |                                   |                                   |
| TOTAL                          |      | 950700.0                      | 181.4                             | 127.0                             |

|             |    |           |       |       |
|-------------|----|-----------|-------|-------|
| STANDARD MR | 1  | 91200.0   | 0.0   | 0.0   |
|             | 2  | 82600.0   | 0.0   | 0.0   |
|             | 3  | 88600.0   | 24.9  | 17.4  |
|             | 4  | 93900.0   | 46.1  | 32.2  |
|             | 5  | 98700.0   | 42.3  | 29.6  |
|             | 6  | 100500.0  | 37.7  | 26.4  |
|             | 7  | 105200.0  |       |       |
|             | 8  | 108700.0  |       |       |
|             | 9  | 113800.0  |       |       |
|             | 10 | 117600.0  |       |       |
| TOTAL       |    | 1008800.0 | 150.9 | 105.6 |

|         |    |          |       |      |
|---------|----|----------|-------|------|
| SPARROW | 1  | 45600.0  | 0.0   | 0.0  |
|         | 2  | 48400.0  | 0.0   | 0.0  |
|         | 3  | 82700.0  | 23.2  | 16.2 |
|         | 4  | 82200.0  | 40.3  | 28.2 |
|         | 5  | 84100.0  | 36.1  | 25.2 |
|         | 6  | 32700.0  | 12.3  | 8.6  |
|         | 7  | 34500.0  |       |      |
|         | 8  | 35400.0  |       |      |
|         | 9  | 37300.0  |       |      |
|         | 10 | 38300.0  |       |      |
| TOTAL   |    | 521200.0 | 111.8 | 78.3 |

|                   |    |          |      |      |
|-------------------|----|----------|------|------|
| MK15 PHALANX CIMS | 1  | 67200.0  | 0.0  | 0.0  |
|                   | 2  | 93800.0  | 0.0  | 0.0  |
|                   | 3  | 85500.0  | 28.6 | 20.0 |
|                   | 4  | 89600.0  | 52.3 | 36.6 |
|                   | 5  | 107000.0 | 54.6 | 38.2 |
|                   | 6  | 111280.0 | 49.6 | 34.8 |
|                   | 7  | 95310.0  |      |      |
|                   | 8  | 0.0      |      |      |
|                   | 9  | 0.0      |      |      |
|                   | 10 | 0.0      |      |      |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

|    |          |      |      |
|----|----------|------|------|
| 3  | 85500.0  | 28.7 | 20.0 |
| 4  | 89600.0  | 52.2 | 36.6 |
| 5  | 107000.0 | 54.6 | 38.2 |
| 6  | 111200.0 | 49.6 | 34.0 |
| 7  | 95310.0  |      |      |
| 8  | 0.0      |      |      |
| 9  | 0.0      |      |      |
| 10 | 0.0      |      |      |

|       |          |       |       |
|-------|----------|-------|-------|
| TOTAL | 649690.0 | 185.1 | 129.6 |
|-------|----------|-------|-------|

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

| PROJECT TITLE       | YEAR | PROJECT COST (\$ THOUSANDS) | NET GAIN (\$ THOUSANDS)<br>(UPPER) | (LOWER) |
|---------------------|------|-----------------------------|------------------------------------|---------|
| INTERACTIVE TESTING | 1    | 0.0                         | 0.0                                | 0.0     |
|                     | 2    | 0.0                         | 0.0                                | 0.0     |
|                     | 3    | 50.0                        | 39.3                               | 12.5    |
|                     | 4    | 0.0                         | 207.9                              | 145.5   |
|                     | 5    | 0.0                         | 194.9                              | 136.4   |
|                     | 6    | 0.0                         | 137.1                              | 95.9    |
|                     | 7    | 0.0                         |                                    |         |
|                     | 8    | 0.0                         |                                    |         |
|                     | 9    | 0.0                         |                                    |         |
|                     | 10   | 0.0                         |                                    |         |
| TOTAL               |      | 50.0                        | 579.2                              | 390.4   |

----- MANUFACTURING TECHNOLOGY STUDY --- 06/07/77 -----

PROJECT - 11 DATA LNK-SUPPLR/ASMB

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|------|-------------------------------|-----------------------------------|-----------------------------------|
| STANDARD ER (SM-2)             | 1    | 37800.0                       | 0.0                               | 0.0                               |
|                                | 2    | 39800.0                       | 0.0                               | 0.0                               |
|                                | 3    | 45300.0                       | 0.0                               | 0.0                               |
|                                | 4    | 141200.0                      | 26.0                              | 19.5                              |
|                                | 5    | 144800.0                      | 46.4                              | 34.8                              |
|                                | 6    | 100100.0                      | 28.1                              | 21.1                              |
|                                | 7    | 104100.0                      | 25.6                              | 19.2                              |
|                                | 8    | 108300.0                      |                                   |                                   |
|                                | 9    | 112600.0                      |                                   |                                   |
|                                | 10   | 117100.0                      |                                   |                                   |
| TOTAL                          |      | 950700.0                      | 126.1                             | 94.6                              |

|             |    |           |       |      |
|-------------|----|-----------|-------|------|
| STANDARD MR | 1  | 91200.0   | 0.0   | 0.0  |
|             | 2  | 82600.0   | 0.0   | 0.0  |
|             | 3  | 88600.0   | 0.0   | 0.0  |
|             | 4  | 93900.0   | 17.3  | 13.0 |
|             | 5  | 98700.0   | 31.7  | 23.8 |
|             | 6  | 100500.0  | 28.2  | 21.2 |
|             | 7  | 105200.0  | 25.8  | 19.4 |
|             | 8  | 108700.0  |       |      |
|             | 9  | 113000.0  |       |      |
|             | 10 | 117600.0  |       |      |
| TOTAL       |    | 1000900.0 | 103.1 | 77.3 |

|         |    |          |      |      |
|---------|----|----------|------|------|
| SPARRON | 1  | 45600.0  | 0.0  | 0.0  |
|         | 2  | 48400.0  | 0.0  | 0.0  |
|         | 3  | 82700.0  | 0.0  | 0.0  |
|         | 4  | 82200.0  | 15.1 | 11.3 |
|         | 5  | 84100.0  | 27.0 | 20.3 |
|         | 6  | 32700.0  | 9.2  | 6.9  |
|         | 7  | 34500.0  | 8.5  | 6.4  |
|         | 8  | 35400.0  |      |      |
|         | 9  | 37300.0  |      |      |
|         | 10 | 38300.0  |      |      |
| TOTAL   |    | 521200.0 | 59.8 | 44.9 |

|                   |    |          |      |      |
|-------------------|----|----------|------|------|
| MK15 PHALANX CIMS | 1  | 67200.0  | 0.0  | 0.0  |
|                   | 2  | 93800.0  | 0.0  | 0.0  |
|                   | 3  | 85500.0  | 0.0  | 0.0  |
|                   | 4  | 89600.0  | 19.6 | 14.7 |
|                   | 5  | 107000.0 | 41.0 | 30.7 |
|                   | 6  | 111280.0 | 37.2 | 27.9 |
|                   | 7  | 95310.0  | 27.9 | 20.9 |
|                   | 8  | 0.0      |      |      |
|                   | 9  | 0.0      |      |      |
|                   | 10 | 0.0      |      |      |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.



----- MANUFACTURING TECHNOLOGY STUDY --- 06/07/77 -----

PROJECT - 12 AUTO FAULT ISOLATION

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|------|-------------------------------|-----------------------------------|-----------------------------------|
| STANDARD ER (SM-2)             | 1    | 37800.0                       | 0.0                               | 0.0                               |
|                                | 2    | 39800.0                       | 0.0                               | 0.0                               |
|                                | 3    | 45300.0                       | 0.0                               | 0.0                               |
|                                | 4    | 141200.0                      | 173.1                             | 129.6                             |
|                                | 5    | 144400.0                      | 232.1                             | 174.1                             |
|                                | 6    | 100100.0                      | 187.6                             | 140.7                             |
|                                | 7    | 104100.0                      | 170.5                             | 127.9                             |
|                                | 8    | 108300.0                      |                                   |                                   |
|                                | 9    | 112600.0                      |                                   |                                   |
|                                | 10   | 117100.0                      |                                   |                                   |
| TOTAL                          |      | 950700.0                      | 763.3                             | 572.5                             |

|             |    |           |       |       |
|-------------|----|-----------|-------|-------|
| STANDARD MR | 1  | 91200.0   | 0.0   | 0.0   |
|             | 2  | 82600.0   | 0.0   | 0.0   |
|             | 3  | 88600.0   | 0.0   | 0.0   |
|             | 4  | 93900.0   | 115.1 | 86.3  |
|             | 5  | 98700.0   | 158.7 | 119.0 |
|             | 6  | 100500.0  | 188.3 | 141.2 |
|             | 7  | 105200.0  | 172.3 | 129.2 |
|             | 8  | 108700.0  |       |       |
|             | 9  | 113800.0  |       |       |
|             | 10 | 117600.0  |       |       |
| TOTAL       |    | 1000800.0 | 634.4 | 475.0 |

|         |    |          |       |       |
|---------|----|----------|-------|-------|
| SPARROW | 1  | 45600.0  | 0.0   | 0.0   |
|         | 2  | 48400.0  | 0.0   | 0.0   |
|         | 3  | 82700.0  | 0.0   | 0.0   |
|         | 4  | 82200.0  | 100.6 | 75.6  |
|         | 5  | 84100.0  | 135.2 | 101.4 |
|         | 6  | 32700.0  | 61.3  | 46.0  |
|         | 7  | 34500.0  | 56.5  | 42.4  |
|         | 8  | 35400.0  |       |       |
|         | 9  | 37300.0  |       |       |
|         | 10 | 38300.0  |       |       |
| TOTAL   |    | 521200.0 | 353.6 | 265.3 |

|                   |    |          |       |       |
|-------------------|----|----------|-------|-------|
| MMIS PHALANX CINS | 1  | 67200.0  | 0.0   | 0.0   |
|                   | 2  | 93800.0  | 0.0   | 0.0   |
|                   | 3  | 85500.0  | 0.0   | 0.0   |
|                   | 4  | 89600.0  | 130.8 | 98.1  |
|                   | 5  | 107000.0 | 204.8 | 153.6 |
|                   | 6  | 111280.0 | 248.2 | 186.2 |
|                   | 7  | 95310.0  | 185.6 | 139.4 |
|                   | 8  | 0.0      |       |       |
|                   | 9  | 0.0      |       |       |
|                   | 10 | 0.0      |       |       |

Note: For comparison purposes all Mt project savings are terminated after four years. In most cases successful projects will produce additional savings.

|    |          |       |       |
|----|----------|-------|-------|
| 3  | 85500.0  | 0.0   | 0.0   |
| 4  | 89600.0  | 130.6 | 98.1  |
| 5  | 107000.0 | 204.8 | 153.6 |
| 6  | 111200.0 | 240.2 | 186.2 |
| 7  | 95310.0  | 105.6 | 139.4 |
| 8  |          |       |       |
| 9  |          |       |       |
| 10 |          |       |       |

|       |          |       |       |
|-------|----------|-------|-------|
| TOTAL | 649690.0 | 769.6 | 577.2 |
|-------|----------|-------|-------|

Note: For comparison purposes all Mt project savings are terminated after four years. In most cases successful projects will produce additional savings.

| PROJECT TITLE        | YEAR | PROJECT COST<br>(\$ THOUSANDS) | NET GAIN (\$ THOUSANDS)<br>(UPPER) | (LOWER) |
|----------------------|------|--------------------------------|------------------------------------|---------|
| AUTO FAULT ISOLATION | 1    | 0.0                            | 0.0                                | 0.0     |
|                      | 2    | 0.0                            | 0.0                                | 0.0     |
|                      | 3    | 100.0                          | -100.0                             | -100.0  |
|                      | 4    | 100.0                          | 419.8                              | 289.9   |
|                      | 5    |                                | 730.8                              | 540.1   |
|                      | 6    |                                | 685.3                              | 514.0   |
|                      | 7    |                                | 585.1                              | 436.9   |
|                      | 8    |                                |                                    |         |
|                      | 9    |                                |                                    |         |
|                      | 10   |                                |                                    |         |
| TOTAL                |      | 200.0                          | 2321.1                             | 1690.8  |

MANUFACTURING TECHNOLOGY STUDY --- 06/07/77 -----

PROJECT - 14 LO COST HYBRID F14

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|------|-------------------------------|-----------------------------------|-----------------------------------|
| F14A TOMCAT                    | 1    | 727600.0                      | 0.0                               | 0.0                               |
|                                | 2    | 1058000.0                     | 0.0                               | 0.0                               |
|                                | 3    | 1140300.0                     | 0.0                               | 0.0                               |
|                                | 4    | 889300.0                      | 46.7                              | 42.1                              |
|                                | 5    | 761700.0                      | 67.1                              | 60.4                              |
|                                | 6    | 326190.0                      | 25.1                              | 22.6                              |
|                                | 7    | 0.0                           |                                   |                                   |
|                                | 8    | 0.0                           |                                   |                                   |
|                                | 9    | 0.0                           |                                   |                                   |
|                                | 10   | 0.0                           |                                   |                                   |
| TOTAL                          |      | 4903690.0                     | 138.9                             | 125.0                             |

Note: For comparison purposes all Mt  
project savings are terminated after  
four years. In most cases successful  
projects will produce additional  
savings.

| PROJECT TITLE      | YEAR | PROJECT COST<br>(\$ THOUSANDS) | NET GAIN (\$ THOUSANDS)<br>(UPPER) | NET GAIN (\$ THOUSANDS)<br>(LOWER) |
|--------------------|------|--------------------------------|------------------------------------|------------------------------------|
| LO COST HYBRID F14 | 1    | 0.0                            | 0.0                                | 0.0                                |
|                    | 2    | 0.0                            | 0.0                                | 0.0                                |
|                    | 3    | 300.0                          | -300.0                             | -300.0                             |
|                    | 4    | 300.0                          | -253.3                             | -257.9                             |
|                    | 5    | 0.0                            | 67.1                               | 60.4                               |
|                    | 6    | 0.0                            | 25.1                               | 22.6                               |
|                    | 7    | 0.0                            |                                    |                                    |
|                    | 8    | 0.0                            |                                    |                                    |
|                    | 9    | 0.0                            |                                    |                                    |
|                    | 10   | 0.0                            |                                    |                                    |
| TOTAL              |      | 600.0                          | -461.1                             | -475.0                             |



PROJECT - 15 MFG MAG COMPONENTS

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$,THOUSANDS) | SAVINGS (\$,THOUSANDS)<br>(UPPER) | SAVINGS (\$,THOUSANDS)<br>(LOWER) |
|--------------------------------|------|-------------------------------|-----------------------------------|-----------------------------------|
| AWG-9 MPN CNTRL SYST           | 1    | 12000.0                       | 0.0                               | 0.0                               |
|                                | 2    | 12400.0                       | 0.0                               | 0.0                               |
|                                | 3    | 9090.0                        | 0.0                               | 0.0                               |
|                                | 4    | 11470.0                       | 32.1                              | 22.5                              |
|                                | 5    | 4910.0                        | 23.6                              | 16.5                              |
|                                | 6    | 0.0                           |                                   |                                   |
|                                | 7    | 0.0                           |                                   |                                   |
|                                | 8    | 0.0                           |                                   |                                   |
|                                | 9    | 0.0                           |                                   |                                   |
|                                | 10   | 0.0                           |                                   |                                   |
| TOTAL                          |      | 49950.0                       | 55.7                              | 39.0                              |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

| PROJECT TITLE      | YEAR | PROJECT COST<br>(\$,THOUSANDS) | NET GAIN (\$,THOUSANDS)<br>(UPPER) | NET GAIN (\$,THOUSANDS)<br>(LOWER) |
|--------------------|------|--------------------------------|------------------------------------|------------------------------------|
| MFG MAG COMPONENTS | 1    | 0.0                            | 0.0                                | 0.0                                |
|                    | 2    | 0.0                            | 0.0                                | 0.0                                |
|                    | 3    | 150.0                          | -150.0                             | -150.0                             |
|                    | 4    | 300.0                          | -267.9                             | -277.5                             |
|                    | 5    | 0.0                            | 23.6                               | 16.5                               |
|                    | 6    | 0.0                            |                                    |                                    |
|                    | 7    | 0.0                            |                                    |                                    |
|                    | 8    | 0.0                            |                                    |                                    |
|                    | 9    | 0.0                            |                                    |                                    |
|                    | 10   | 0.0                            |                                    |                                    |
| TOTAL              |      | 450.0                          | -394.3                             | -411.0                             |

----- MANUFACTURING TECHNOLOGY STUDY --- 06/07/77 -----

PROJECT - 18 SAW REPLICATN DNAS08

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|------|-------------------------------|-----------------------------------|-----------------------------------|
| APS 115 RADAR                  | 1    | 2500.0                        | 0.0                               | 0.0                               |
|                                | 2    | 2600.0                        | 0.0                               | 0.0                               |
|                                | 3    | 2800.0                        | 0.0                               | 0.0                               |
|                                | 4    | 3100.0                        | .4                                | .2                                |
|                                | 5    | 5100.0                        | 1.0                               | .5                                |
|                                | 6    | 5300.0                        | .9                                | .5                                |
|                                | 7    | 5500.0                        | .9                                | .4                                |
|                                | 8    | -0.0                          |                                   |                                   |
|                                | 9    | -0.0                          |                                   |                                   |
|                                | 10   | -0.0                          |                                   |                                   |
| TOTAL                          |      | 26900.0                       | 3.2                               | 1.6                               |

Note: For comparison purposes all Mt project savings are terminated after four years. In most cases successful projects will produce additional savings.

| PROJECT TITLE        | YEAR | PROJECT COST<br>(\$ THOUSANDS) | NET GAIN (\$ THOUSANDS)<br>(UPPER) | NET GAIN (\$ THOUSANDS)<br>(LOWER) |
|----------------------|------|--------------------------------|------------------------------------|------------------------------------|
| SAW REPLICATN DNAS08 | 1    | 0.0                            | 0.0                                | 0.0                                |
|                      | 2    | 0.0                            | 0.0                                | 0.0                                |
|                      | 3    | 250.0                          | -250.0                             | -250.0                             |
|                      | 4    | 0.0                            | .4                                 | .2                                 |
|                      | 5    | 0.0                            | 1.0                                | .5                                 |
|                      | 6    | 0.0                            | .9                                 | .5                                 |
|                      | 7    | 0.0                            | .9                                 | .4                                 |
|                      | 8    | 0.0                            |                                    |                                    |
|                      | 9    | 0.0                            |                                    |                                    |
|                      | 10   | 0.0                            |                                    |                                    |
| TOTAL                |      | 250.0                          | -246.8                             | -248.4                             |

MANUFACTURING TECHNOLOGY STUDY --- 06/07/77

PROJECT - 20 RF PACKG TECH DNE027

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|------|-------------------------------|-----------------------------------|-----------------------------------|
| TPS-59 RADAR                   | 1    | 0.0                           | 0.0                               | 0.0                               |
|                                | 2    | 8300.0                        | 0.0                               | 0.0                               |
|                                | 3    | 8700.0                        | 0.0                               | 0.0                               |
|                                | 4    | 9000.0                        | 2.6                               | 1.8                               |
|                                | 5    | 9400.0                        | 4.2                               | 2.9                               |
|                                | 6    | 9700.0                        | 3.8                               | 2.7                               |
|                                | 7    | 10100.0                       | 3.4                               | 2.4                               |
|                                | 8    | 0.0                           |                                   |                                   |
|                                | 9    | 0.0                           |                                   |                                   |
|                                | 10   | 0.0                           |                                   |                                   |
| TOTAL                          |      | 55200.0                       | 14.1                              | 9.8                               |

Note: For comparison purposes all Mt project savings are terminated after four years. In most cases successful projects will produce additional savings.

| PROJECT TITLE        | YEAR | PROJECT COST<br>(\$ THOUSANDS) | NET GAIN (\$ THOUSANDS)<br>(UPPER) | NET GAIN (\$ THOUSANDS)<br>(LOWER) |
|----------------------|------|--------------------------------|------------------------------------|------------------------------------|
| RF PACKG TECH DNE027 | 1    | 0.0                            | 0.0                                | 0.0                                |
|                      | 2    | 0.0                            | 0.0                                | 0.0                                |
|                      | 3    | 95.0                           | -95.0                              | -95.0                              |
|                      | 4    | 45.0                           | -42.4                              | -43.2                              |
|                      | 5    | 0.0                            | 4.2                                | 2.9                                |
|                      | 6    | 0.0                            | 3.8                                | 2.7                                |
|                      | 7    | 0.0                            | 3.4                                | 2.4                                |
|                      | 8    | 0.0                            |                                    |                                    |
|                      | 9    | 0.0                            |                                    |                                    |
|                      | 10   | 0.0                            |                                    |                                    |
| TOTAL                |      | 140.0                          | -125.9                             | -130.2                             |



MANUFACTURING TECHNOLOGY STUDY -- 06/07/77

PROJECT - 22 EBS DEVICES DNE042

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|------|-------------------------------|-----------------------------------|-----------------------------------|
| TPS-59 RADAR                   | 1    | 0.0                           | 0.0                               | 0.0                               |
|                                | 2    | 8300.0                        | 0.0                               | 0.0                               |
|                                | 3    | 8700.0                        | 1.9                               | .6                                |
|                                | 4    | 9000.0                        | 3.4                               | 1.0                               |
|                                | 5    | 9400.0                        | 3.1                               | .9                                |
|                                | 6    | 9700.0                        | 2.8                               | .8                                |
|                                | 7    | 10100.0                       |                                   |                                   |
|                                | 8    | 0.0                           |                                   |                                   |
|                                | 9    | 0.0                           |                                   |                                   |
|                                | 10   | 0.0                           |                                   |                                   |
| TOTAL                          |      | 55200.0                       | 11.1                              | 3.3                               |

|                |    |         |     |     |
|----------------|----|---------|-----|-----|
| ALO-78 ECM SET | 1  | 2500.0  | 0.0 | 0.0 |
|                | 2  | 2600.0  | 0.0 | 0.0 |
|                | 3  | 2700.0  | .6  | .2  |
|                | 4  | 3100.0  | 1.2 | .3  |
|                | 5  | 5100.0  | 1.7 | .5  |
|                | 6  | 5300.0  | 1.5 |     |
|                | 7  | 5500.0  |     |     |
|                | 8  | 0.0     |     |     |
|                | 9  | 0.0     |     |     |
|                | 10 | 0.0     |     |     |
| TOTAL          |    | 26800.0 | 4.9 | 1.5 |

|               |    |        |     |     |
|---------------|----|--------|-----|-----|
| ALR-59 EW SET | 1  | 1600.0 | 0.0 | 0.0 |
|               | 2  | 1600.0 | 0.0 | 0.0 |
|               | 3  | 1700.0 | .4  | .1  |
|               | 4  | 1800.0 | .7  | .2  |
|               | 5  | 1800.0 | .6  | .2  |
|               | 6  | 0.0    |     |     |
|               | 7  | 0.0    |     |     |
|               | 8  | 0.0    |     |     |
|               | 9  | 0.0    |     |     |
|               | 10 | 0.0    |     |     |
| TOTAL         |    | 8500.0 | 1.6 | .5  |

| PROJECT TITLE      | YEAR | PROJECT COST<br>(\$ THOUSANDS) | NET GAIN (\$ THOUSANDS)<br>(UPPER) | NET GAIN (\$ THOUSANDS)<br>(LOWER) |
|--------------------|------|--------------------------------|------------------------------------|------------------------------------|
| EBS DEVICES DNE042 | 1    | 0.0                            | 0.0                                | 0.0                                |
|                    | 2    | 0.0                            | 0.0                                | 0.0                                |
|                    | 3    | 280.0                          | -277.2                             | -279.2                             |
|                    | 4    | 0.0                            | 5.2                                | 1.6                                |
|                    | 5    | 0.0                            | 5.3                                | 1.6                                |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

**Note:** For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

[illegible]

SCIENCE APPLICATIONS, INC. MCLEAN, VA. ---

## ----- MANUFACTURING TECHNOLOGY STUDY --- 06/07/77 -----

## PROJECT - 24 ION IMPLANTATION DNA44

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS) |         |
|--------------------------------|------|-------------------------------|------------------------|---------|
|                                |      |                               | (UPPER)                | (LOWER) |
| F14A TOMCAT                    |      |                               |                        |         |
|                                | 1    | 727600.0                      | 0.0                    | 0.0     |
|                                | 2    | 1058800.0                     | 0.0                    | 0.0     |
|                                | 3    | 1140300.0                     | 0.0                    | 0.0     |
|                                | 4    | 889300.0                      | 0.0                    | 0.0     |
|                                | 5    | 761700.0                      | 297.4                  | 208.2   |
|                                | 6    | 326190.0                      | 185.5                  | 129.9   |
|                                | 7    | 0.0                           |                        |         |
|                                | 8    | 0.0                           |                        |         |
|                                | 9    | 0.0                           |                        |         |
|                                | 10   | 0.0                           |                        |         |
| TOTAL                          |      | 4903690.0                     | 482.9                  | 338.0   |

|       |    |           |        |        |
|-------|----|-----------|--------|--------|
| F16   |    |           |        |        |
| 1     | 1  | -0.0      | 0.0    | 0.0    |
| 2     | 2  | 309860.0  | 0.0    | 0.0    |
| 3     | 3  | 565000.0  | 0.0    | 0.0    |
| 4     | 4  | 824900.0  | 0.0    | 0.0    |
| 5     | 5  | 1028800.0 | 401.7  | 281.2  |
| 6     | 6  | 802440.0  | 456.4  | 319.5  |
| 7     | 7  | 612000.0  | 304.3  | 213.0  |
| 8     | 8  | 617190.0  | 268.2  | 187.8  |
| 9     | 9  | 805560.0  |        |        |
| 10    | 10 | 688410.0  |        |        |
| TOTAL |    | 6254160.0 | 1430.6 | 1001.4 |

Note: For comparison purposes all Mt  
project savings are terminated after  
four years. In most cases successful  
projects will produce additional  
savings.

| PROJECT TITLE          | YEAR | PROJECT COST<br>(\$ THOUSANDS) | NET GAIN (\$ THOUSANDS) |         |
|------------------------|------|--------------------------------|-------------------------|---------|
|                        |      |                                | (UPPER)                 | (LOWER) |
| ION IMPLANTATION DNA44 |      |                                |                         |         |
|                        | 1    | 0.0                            | 0.0                     | 0.0     |
|                        | 2    | 0.0                            | 0.0                     | 0.0     |
|                        | 3    | 230.0                          | -230.0                  | -230.0  |
|                        | 4    | 100.0                          | -100.0                  | -100.0  |
|                        | 5    | 250.0                          | 489.0                   | 239.3   |
|                        | 6    | 0.0                            | 642.0                   | 449.4   |
|                        | 7    | 0.0                            | 304.3                   | 213.0   |
|                        | 8    | 0.0                            | 268.2                   | 187.8   |
|                        | 9    | 0.0                            |                         |         |
|                        | 10   | 0.0                            |                         |         |
| TOTAL                  |      | 580.0                          | 1333.5                  | 759.5   |



| PROJECT TITLE        | YEAR | PROJECT COST<br>(THOUSANDS) | NET UNIT (CONTINUOUS) | UPPER  | LOWER  |
|----------------------|------|-----------------------------|-----------------------|--------|--------|
| ENCODER OPMAG DNAS04 | 1    | 0.0                         | 0.0                   | 0.0    | 0.0    |
|                      | 2    | 0.0                         | 0.0                   | 0.0    | 0.0    |
|                      | 3    | 170.0                       | -170.0                | -170.0 | -170.0 |
|                      | 4    | 100.0                       | -100.0                | -100.0 | -100.0 |
|                      | 5    | 90.0                        | -84.6                 | -84.6  | -85.9  |
|                      | 6    |                             | 9.0                   | 9.0    | 6.8    |
|                      | 7    |                             | 7.0                   | 7.0    | 5.3    |
|                      | 8    |                             | 5.6                   | 5.6    | 4.2    |
|                      | 9    |                             |                       |        |        |
|                      | 10   |                             |                       |        |        |
| TOTAL                |      | 360.0                       | -332.9                | -339.7 |        |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

## MANUFACTURING TECHNOLOGY STUDY --- 06/07/77

## PROJECT - 25 ENCODER OPMAG DNA504

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|------|-------------------------------|-----------------------------------|-----------------------------------|
| UYK-7 COMPUTER                 | 1    | 20176.0                       | 0.0                               | 0.0                               |
|                                | 2    | 25956.0                       | 0.0                               | 0.0                               |
|                                | 3    | 36920.0                       | 0.0                               | 0.0                               |
|                                | 4    | 16378.0                       | 0.0                               | 0.0                               |
|                                | 5    | 13626.0                       | 2.1                               | 1.6                               |
|                                | 6    | 9616.0                        | 2.6                               | 1.9                               |
|                                | 7    | 6580.0                        | 1.5                               | 1.2                               |
|                                | 8    | 6043.0                        | 1.4                               | 1.0                               |
|                                | 9    | 7117.0                        |                                   |                                   |
|                                | 10   | 7401.0                        |                                   |                                   |
| TOTAL                          |      | 152615.0                      | 7.6                               | 5.7                               |

|                 |    |          |      |      |
|-----------------|----|----------|------|------|
| AYK-14 COMPUTER | 1  | 4500.0   | 0.0  | 0.0  |
|                 | 2  | 2000.0   | 0.0  | 0.0  |
|                 | 3  | 16884.0  | 0.0  | 0.0  |
|                 | 4  | 19130.0  | 0.0  | 0.0  |
|                 | 5  | 21678.0  | 3.3  | 2.5  |
|                 | 6  | 24088.0  | 6.4  | 4.8  |
|                 | 7  | 23448.0  | 5.5  | 4.1  |
|                 | 8  | 20710.0  | 4.2  | 3.2  |
|                 | 9  | 21518.0  |      |      |
|                 | 10 | 13730.0  |      |      |
| TOTAL           |    | 167706.0 | 19.5 | 14.6 |

Note: For comparison purposes all MT  
project savings are terminated after  
four years. In most cases successful  
projects will produce additional  
savings.

|       |    |      |     |     |
|-------|----|------|-----|-----|
| AIMS  | 1  | -0.0 | 0.0 | 0.0 |
|       | 2  | -0.0 | 0.0 | 0.0 |
|       | 3  | -0.0 | 0.0 | 0.0 |
|       | 4  | -0.0 | 0.0 | 0.0 |
|       | 5  | -0.0 | 0.0 | 0.0 |
|       | 6  | -0.0 | 0.0 | 0.0 |
|       | 7  | -0.0 | 0.0 | 0.0 |
|       | 8  | -0.0 | 0.0 | 0.0 |
|       | 9  | -0.0 | 0.0 | 0.0 |
|       | 10 | -0.0 | 0.0 | 0.0 |
| TOTAL |    | 0.0  | 0.0 | 0.0 |

| PROJECT TITLE        | YEAR | PROJECT COST<br>(\$ THOUSANDS) | NET GAIN (\$ THOUSANDS)<br>(UPPER) | NET GAIN (\$ THOUSANDS)<br>(LOWER) |
|----------------------|------|--------------------------------|------------------------------------|------------------------------------|
| ENCODER OPMAG DNA504 | 1    | 0.0                            | 0.0                                | 0.0                                |
|                      | 2    | 0.0                            | 0.0                                | 0.0                                |
|                      | 3    | 170.0                          | -170.0                             | -170.0                             |
|                      | 4    | 100.0                          | -100.0                             | -100.0                             |
|                      | 5    | 90.0                           | -64.6                              | -85.9                              |

|       |          |       |      |
|-------|----------|-------|------|
| 3     | 85500.0  | 19.6  | 0.0  |
| 4     | 89600.0  | 14.7  | 0.0  |
| 5     | 107000.0 | 41.0  | 30.7 |
| 6     | 111280.0 | 37.2  | 27.9 |
| 7     | 95310.0  | 27.9  | 20.9 |
| 8     | 0.0      |       |      |
| 9     | 0.0      |       |      |
| 10    | 0.0      |       |      |
| TOTAL | 649690.0 | 125.7 | 94.3 |

| PROJECT TITLE        | YEAR | PROJECT COST<br>(\$ THOUSANDS) | NET GAIN (UPPER)<br>(\$ THOUSANDS) | NET GAIN (LOWER)<br>(\$ THOUSANDS) |
|----------------------|------|--------------------------------|------------------------------------|------------------------------------|
| DATA LNK-SUPPLR/ASMB | 1    | 0.0                            | 0.0                                | 0.0                                |
|                      | 2    | 0.0                            | 0.0                                | 0.0                                |
|                      | 3    | 50.0                           | -50.0                              | -50.0                              |
|                      | 4    | 0.0                            | 78.0                               | 58.5                               |
|                      | 5    | 0.0                            | 146.2                              | 109.6                              |
|                      | 6    | 0.0                            | 102.8                              | 77.1                               |
|                      | 7    | 0.0                            | 87.8                               | 65.8                               |
|                      | 8    | 0.0                            |                                    |                                    |
|                      | 9    | 0.0                            |                                    |                                    |
|                      | 10   | 0.0                            |                                    |                                    |
| TOTAL                |      | 50.0                           | 364.7                              | 261.0                              |

Note: For comparison purposes all Mt project savings are terminated after four years. In most cases successful projects will produce additional savings.



## MANUFACTURING TECHNOLOGY STUDY --- 06/07/77 -----

## PROJECT - 28 COAX MAG REFIN A608A

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|------|-------------------------------|-----------------------------------|-----------------------------------|
| TPS-S9 RADAR                   | 1    | 0.0                           | 0.0                               | 0.0                               |
|                                | 2    | 8300.0                        | 0.0                               | 0.0                               |
|                                | 3    | 8700.0                        | 0.0                               | 0.0                               |
|                                | 4    | 9000.0                        | 32.8                              | 23.0                              |
|                                | 5    | 9400.0                        | 60.0                              | 42.0                              |
|                                | 6    | 9700.0                        | 54.1                              | 37.9                              |
|                                | 7    | 10100.0                       | 49.2                              | 34.5                              |
|                                | 8    | 0.0                           |                                   |                                   |
|                                | 9    | 0.0                           |                                   |                                   |
|                                | 10   | 0.0                           |                                   |                                   |

TOTAL 55200.0 196.1 137.3

|               |    |        |      |      |
|---------------|----|--------|------|------|
| APS 115 RADAR | 1  | 2500.0 | 0.0  | 0.0  |
|               | 2  | 2600.0 | 0.0  | 0.0  |
|               | 3  | 2800.0 | 0.0  | 0.0  |
|               | 4  | 3100.0 | 11.3 | 7.9  |
|               | 5  | 5100.0 | 32.5 | 22.8 |
|               | 6  | 5300.0 | 29.6 | 20.7 |
|               | 7  | 5500.0 | 26.8 | 18.8 |
|               | 8  | -0.0   |      |      |
|               | 9  | -0.0   |      |      |
|               | 10 | -0.0   |      |      |

TOTAL 26900.0 100.2 70.1

|         |    |          |       |       |
|---------|----|----------|-------|-------|
| HARPOON | 1  | 141700.0 | 0.0   | 0.0   |
|         | 2  | 162000.0 | 0.0   | 0.0   |
|         | 3  | 156200.0 | 0.0   | 0.0   |
|         | 4  | 156300.0 | 239.5 | 167.7 |
|         | 5  | 156400.0 | 419.1 | 293.3 |
|         | 6  | 41700.0  | 97.7  | 68.4  |
|         | 7  | 43400.0  | 88.9  | 62.2  |
|         | 8  | 45100.0  |       |       |
|         | 9  | 46900.0  |       |       |
|         | 10 | 48800.0  |       |       |

TOTAL 998500.0 845.1 591.6

|         |    |          |       |       |
|---------|----|----------|-------|-------|
| PHOENIX | 1  | 69200.0  | 0.0   | 0.0   |
|         | 2  | 79400.0  | 0.0   | 0.0   |
|         | 3  | 100300.0 | 0.0   | 0.0   |
|         | 4  | 91800.0  | 143.8 | 100.6 |
|         | 5  | 90300.0  | 241.9 | 169.8 |
|         | 6  | 16400.0  | 38.4  | 26.9  |
|         | 7  | 17100.0  | 35.0  | 24.5  |
|         | 8  | 16200.0  |       |       |
|         | 9  | 18500.0  |       |       |
|         | 10 | 19200.0  |       |       |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

|    |          |       |       |
|----|----------|-------|-------|
| 2  | 79000.0  | 0.0   | 0.0   |
| 3  | 103000.0 | 0.0   | 0.0   |
| 4  | 93000.0  | 143.8 | 100.6 |
| 5  | 90300.0  | 241.9 | 169.4 |
| 6  | 14000.0  | 38.4  | 26.9  |
| 7  | 17100.0  | 35.0  | 24.5  |
| 8  | 18200.0  |       |       |
| 9  | 18500.0  |       |       |
| 10 | 19200.0  |       |       |

|       |          |       |       |
|-------|----------|-------|-------|
| TOTAL | 522400.0 | 459.1 | 321.4 |
|-------|----------|-------|-------|

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

| PROJECT TITLE        | YEAR | PROJECT COST (\$ THOUSANDS) | NET GAIN (\$ THOUSANDS)<br>(UPPER) | NET GAIN (\$ THOUSANDS)<br>(LOWER) |
|----------------------|------|-----------------------------|------------------------------------|------------------------------------|
| COAX MAG REFIN A608A | 1    | 0.0                         | 0.0                                | 0.0                                |
|                      | 2    | 0.0                         | 0.0                                | 0.0                                |
|                      | 3    | 100.0                       | -100.0                             | -100.0                             |
|                      | 4    | 0.0                         | 427.5                              | 299.2                              |
|                      | 5    | 0.0                         | 753.5                              | 527.4                              |
|                      | 6    | 0.0                         | 219.7                              | 153.8                              |
|                      | 7    | 0.0                         | 199.9                              | 139.9                              |
|                      | 8    | 0.0                         |                                    |                                    |
|                      | 9    | 0.0                         |                                    |                                    |
|                      | 10   | 0.0                         |                                    |                                    |
| TOTAL                |      | 100.0                       | 1500.6                             | 1020.4                             |

## ----- MANUFACTURING TECHNOLOGY STUDY --- 06/07/77 -----

## PROJECT - 29 MAG IMPROVMT A637A

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|------|-------------------------------|-----------------------------------|-----------------------------------|
| TPS-59 RADAR                   |      |                               |                                   |                                   |
|                                | 1    | 0.0                           | 0.0                               | 0.0                               |
|                                | 2    | 8300.0                        | 0.0                               | 0.0                               |
|                                | 3    | 8700.0                        | 0.0                               | 0.0                               |
|                                | 4    | 9000.0                        | 0.0                               | 0.0                               |
|                                | 5    | 9400.0                        | 12.0                              | 8.4                               |
|                                | 6    | 9700.0                        | 16.2                              | 11.4                              |
|                                | 7    | 10100.0                       | 14.6                              | 10.3                              |
|                                | 8    | 0.0                           |                                   |                                   |
|                                | 9    | 0.0                           |                                   |                                   |
|                                | 10   | 0.0                           |                                   |                                   |
| TOTAL                          |      | 55200.0                       | 43.0                              | 30.1                              |

|               |    |         |      |      |
|---------------|----|---------|------|------|
| APS 115 RADAR |    |         |      |      |
|               | 1  | 2500.0  | 0.0  | 0.0  |
|               | 2  | 2600.0  | 0.0  | 0.0  |
|               | 3  | 2800.0  | 0.0  | 0.0  |
|               | 4  | 3100.0  | 0.0  | 0.0  |
|               | 5  | 5100.0  | 6.5  | 4.6  |
|               | 6  | 5300.0  | 8.9  | 6.2  |
|               | 7  | 5500.0  | 8.0  | 5.6  |
|               | 8  | -0.0    |      |      |
|               | 9  | -0.0    |      |      |
|               | 10 | -0.0    |      |      |
| TOTAL         |    | 26900.0 | 23.4 | 16.4 |

|         |    |          |       |       |
|---------|----|----------|-------|-------|
| HARPOON |    |          |       |       |
|         | 1  | 141700.0 | 0.0   | 0.0   |
|         | 2  | 162000.0 | 0.0   | 0.0   |
|         | 3  | 156200.0 | 0.0   | 0.0   |
|         | 4  | 156300.0 | 0.0   | 0.0   |
|         | 5  | 156400.0 | 83.8  | 58.7  |
|         | 6  | 41700.0  | 29.3  | 20.5  |
|         | 7  | 43400.0  | 26.7  | 18.7  |
|         | 8  | 45100.0  | 24.2  | 16.9  |
|         | 9  | 46900.0  |       |       |
|         | 10 | 48800.0  |       |       |
| TOTAL   |    | 948500.0 | 164.0 | 114.8 |

|         |    |          |      |      |
|---------|----|----------|------|------|
| PHOENIX |    |          |      |      |
|         | 1  | 69200.0  | 0.0  | 0.0  |
|         | 2  | 79400.0  | 0.0  | 0.0  |
|         | 3  | 100300.0 | 0.0  | 0.0  |
|         | 4  | 93800.0  | 0.0  | 0.0  |
|         | 5  | 90300.0  | 48.4 | 33.9 |
|         | 6  | 16400.0  | 11.5 | 8.1  |
|         | 7  | 17100.0  | 10.5 | 7.4  |
|         | 8  | 18200.0  | 9.8  | 6.8  |
|         | 9  | 18500.0  |      |      |
|         | 10 | 19200.0  |      |      |

Note: For comparison purposes all MT  
project savings are terminated after  
four years. In most cases successful  
projects will produce additional  
savings.

|       |          |      |      |
|-------|----------|------|------|
| 6     | 16400.0  | 1.5  | 8.1  |
| 7     | 17100.0  | 1.5  | 7.4  |
| 8     | 18200.0  | 9.8  | 6.8  |
| 9     | 18500.0  |      |      |
| 10    | 19200.0  |      |      |
| TOTAL | 522400.0 | 80.2 | 56.1 |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

| PROJECT TITLE      | YEAR | PROJECT COST<br>(\$ THOUSANDS) | NET GAIN (\$ THOUSANDS)<br>(UPPER) | NET GAIN (\$ THOUSANDS)<br>(LOWER) |
|--------------------|------|--------------------------------|------------------------------------|------------------------------------|
| MAG IMPROVMT A637A | 1    | 0.0                            | 0.0                                | 0.0                                |
|                    | 2    | 0.0                            | 0.0                                | 0.0                                |
|                    | 3    | 150.0                          | -150.0                             | -150.0                             |
|                    | 4    | 100.0                          | -100.0                             | -100.0                             |
|                    | 5    | 0.0                            | 150.7                              | 105.5                              |
|                    | 6    | 0.0                            | 65.9                               | 46.1                               |
|                    | 7    | 0.0                            | 60.0                               | 42.0                               |
|                    | 8    | 0.0                            | 34.0                               | 23.0                               |
|                    | 9    | 0.0                            |                                    |                                    |
|                    | 10   | 0.0                            |                                    |                                    |
| TOTAL              |      | 250.0                          | -60.6                              | -32.6                              |

----- SCIENCE APPLICATIONS, INC. MCLEAN, VA. -----

----- MANUFACTURING TECHNOLOGY STUDY --- 06/07/77 -----



## ----- MANUFACTURING TECHNOLOGY STUDY --- 06/07/77 -----

| PROJECT - 33 GAAS FET A6218    |      | SYSTEM COST<br>(S. THOUSANDS) |      | SAVINGS (S. THOUSANDS) |         |
|--------------------------------|------|-------------------------------|------|------------------------|---------|
| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR |                               |      | (UPPER)                | (LOWER) |
| =====                          |      |                               |      |                        |         |
| DDG47 AEGIS                    | 1    | 930000.0                      | 0.0  | 0.0                    | 0.0     |
|                                | 2    | 0.0                           | 0.0  | 0.0                    | 0.0     |
|                                | 3    | 1862900.0                     | 0.0  | 0.0                    | 0.0     |
|                                | 4    | 1945400.0                     | 0.0  | 0.0                    | 0.0     |
|                                | 5    | 2038300.0                     | 16.6 | 16.6                   | 11.7    |
|                                | 6    | 0.0                           | 0.0  | 0.0                    | 0.0     |
|                                | 7    | 1469750.0                     | 0.0  | 0.0                    | 0.0     |
|                                | 8    | 2292810.0                     | 13.8 | 13.8                   | 9.6     |
|                                | 9    | 2384520.0                     | 18.8 | 18.8                   | 13.1    |
|                                | 10   | 826630.0                      |      |                        |         |
| TOTAL                          |      | 13770310.0                    | 49.2 |                        | 34.4    |
| -----                          |      |                               |      |                        |         |
| PRC-104 RADIO                  | 1    | 1600.0                        | 0.0  | 0.0                    | 0.0     |
|                                | 2    | 1600.0                        | 0.0  | 0.0                    | 0.0     |
|                                | 3    | -0.0                          | 0.0  | 0.0                    | 0.0     |
|                                | 4    | -0.0                          | 0.0  | 0.0                    | 0.0     |
|                                | 5    | -0.0                          | 0.0  | 0.0                    | 0.0     |
|                                | 6    | -0.0                          | 0.0  | 0.0                    | 0.0     |
|                                | 7    | -0.0                          | 0.0  | 0.0                    | 0.0     |
|                                | 8    | -0.0                          | 0.0  | 0.0                    | 0.0     |
|                                | 9    | -0.0                          | 0.0  | 0.0                    | 0.0     |
|                                | 10   | -0.0                          | 0.0  | 0.0                    | 0.0     |
| TOTAL                          |      | 3200.0                        | 0.0  | 0.0                    | 0.0     |
| -----                          |      |                               |      |                        |         |
| TPS-59 RADAR                   | 1    | 0.0                           | 0.0  | 0.0                    | 0.0     |
|                                | 2    | 8300.0                        | 0.0  | 0.0                    | 0.0     |
|                                | 3    | 8700.0                        | 0.0  | 0.0                    | 0.0     |
|                                | 4    | 9000.0                        | 0.0  | 0.0                    | 0.0     |
|                                | 5    | 9400.0                        | 1.0  | 1.0                    | .7      |
|                                | 6    | 9700.0                        | 1.7  | 1.7                    | 1.2     |
|                                | 7    | 10100.0                       | 1.6  | 1.6                    | 1.1     |
|                                | 8    | 0.0                           |      |                        |         |
|                                | 9    | 0.0                           |      |                        |         |
|                                | 10   | 0.0                           |      |                        |         |
| TOTAL                          |      | 55200.0                       | 4.3  |                        | 3.0     |
| -----                          |      |                               |      |                        |         |
| DTP EW SUITE                   | 1    | 51100.0                       | 0.0  | 0.0                    | 0.0     |
|                                | 2    | 57600.0                       | 0.0  | 0.0                    | 0.0     |
|                                | 3    | 39400.0                       | 0.0  | 0.0                    | 0.0     |
|                                | 4    | 0.0                           | 0.0  | 0.0                    | 0.0     |
|                                | 5    | 0.0                           | 0.0  | 0.0                    | 0.0     |
|                                | 6    | 0.0                           | 0.0  | 0.0                    | 0.0     |
|                                | 7    | 0.0                           | 0.0  | 0.0                    | 0.0     |
|                                | 8    | 0.0                           | 0.0  | 0.0                    | 0.0     |
|                                | 9    | 0.0                           | 0.0  | 0.0                    | 0.0     |
|                                | 10   | 0.0                           | 0.0  | 0.0                    | 0.0     |

Note: For comparison purposes all MT  
project savings are terminated after  
four years. In most cases successful  
projects will produce additional  
savings.

|    |         |     |     |
|----|---------|-----|-----|
| 1  | 57600.0 | 0.0 | 0.0 |
| 2  | 39200.0 | 0.0 | 0.0 |
| 3  | 0.0     | 0.0 | 0.0 |
| 4  | 0.0     | 0.0 | 0.0 |
| 5  | 0.0     | 0.0 | 0.0 |
| 6  | 0.0     | 0.0 | 0.0 |
| 7  | 0.0     | 0.0 | 0.0 |
| 8  | 0.0     | 0.0 | 0.0 |
| 9  | 0.0     | 0.0 | 0.0 |
| 10 | 0.0     | 0.0 | 0.0 |

|       |          |     |     |
|-------|----------|-----|-----|
| TOTAL | 148100.0 | 0.0 | 0.0 |
|-------|----------|-----|-----|

|                |        |     |     |
|----------------|--------|-----|-----|
| ALQ-78 ECM SET |        |     |     |
| 1              | 2500.0 | 0.0 | 0.0 |
| 2              | 2600.0 | 0.0 | 0.0 |
| 3              | 2700.0 | 0.0 | 0.0 |
| 4              | 3100.0 | 0.0 | 0.0 |
| 5              | 5100.0 | 0.0 | 0.0 |
| 6              | 5300.0 | 0.0 | 0.0 |
| 7              | 5500.0 | 0.0 | 0.0 |
| 8              | 0.0    | 0.0 | 0.0 |
| 9              | 0.0    | 0.0 | 0.0 |
| 10             | 0.0    | 0.0 | 0.0 |

|       |         |     |     |
|-------|---------|-----|-----|
| TOTAL | 26800.0 | 2.3 | 1.6 |
|-------|---------|-----|-----|

|               |        |     |     |
|---------------|--------|-----|-----|
| ALR-59 EM SET |        |     |     |
| 1             | 1600.0 | 0.0 | 0.0 |
| 2             | 1600.0 | 0.0 | 0.0 |
| 3             | 1700.0 | 0.0 | 0.0 |
| 4             | 1800.0 | 0.0 | 0.0 |
| 5             | 1800.0 | 0.0 | 0.0 |
| 6             | 0.0    | 0.0 | 0.0 |
| 7             | 0.0    | 0.0 | 0.0 |
| 8             | 0.0    | 0.0 | 0.0 |
| 9             | 0.0    | 0.0 | 0.0 |
| 10            | 0.0    | 0.0 | 0.0 |

|       |        |    |    |
|-------|--------|----|----|
| TOTAL | 8500.0 | .2 | .1 |
|-------|--------|----|----|

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

|               |      |                             |                         |
|---------------|------|-----------------------------|-------------------------|
| PROJECT TITLE | YEAR | PROJECT COST (\$ THOUSANDS) | NET GAIN (\$ THOUSANDS) |
|               |      |                             | (UPPER)                 |
|               |      |                             | (LOWER)                 |

|          |       |        |        |
|----------|-------|--------|--------|
| GAAS FET | A6218 |        |        |
| 1        | 0.0   | 0.0    | 0.0    |
| 2        | 0.0   | 0.0    | 0.0    |
| 3        | 250.0 | -250.0 | -250.0 |
| 4        | 250.0 | -250.0 | -250.0 |
| 5        | 0.0   | 18.3   | 12.8   |
| 6        | 0.0   | 2.7    | 1.9    |
| 7        | 0.0   | 16.2   | 11.3   |
| 8        | 0.0   | 18.6   | 13.1   |
| 9        | 0.0   | 0.0    | 0.0    |
| 10       | 0.0   | 0.0    | 0.0    |

|       |       |        |        |
|-------|-------|--------|--------|
| TOTAL | 500.0 | -444.1 | -460.8 |
|-------|-------|--------|--------|

## ----- MANUFACTURING TECHNOLOGY STUDY --- 06/07/77 -----

## PROJECT - 36 LIGHTWT RF STRIPLINE

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (UPPER)<br>(\$ THOUSANDS) | SAVINGS (LOWER)<br>(\$ THOUSANDS) |
|--------------------------------|------|-------------------------------|-----------------------------------|-----------------------------------|
| TPS-59 RADAR                   | 1    | 0.0                           | 0.0                               | 0.0                               |
|                                | 2    | 8300.0                        | 0.0                               | 0.0                               |
|                                | 3    | 8700.0                        | 72.6                              | 54.5                              |
|                                | 4    | 9000.0                        | 131.4                             | 98.5                              |
|                                | 5    | 9400.0                        | 119.9                             | 89.9                              |
|                                | 6    | 9700.0                        | 108.2                             | 81.1                              |
|                                | 7    | 10100.0                       |                                   |                                   |
|                                | 8    | 0.0                           |                                   |                                   |
|                                | 9    | 0.0                           |                                   |                                   |
|                                | 10   | 0.0                           |                                   |                                   |
| TOTAL                          |      | 55200.0                       | 432.1                             | 324.1                             |

|                |    |         |       |       |
|----------------|----|---------|-------|-------|
| ALQ-78 ECM SET | 1  | 2500.0  | 0.0   | 0.0   |
|                | 2  | 2600.0  | 0.0   | 0.0   |
|                | 3  | 2700.0  | 22.5  | 16.9  |
|                | 4  | 3100.0  | 45.2  | 33.9  |
|                | 5  | 5100.0  | 65.1  | 48.8  |
|                | 6  | 5300.0  | 59.1  | 44.3  |
|                | 7  | 5500.0  |       |       |
|                | 8  | 0.0     |       |       |
|                | 9  | 0.0     |       |       |
|                | 10 | 0.0     |       |       |
| TOTAL          |    | 26800.0 | 192.0 | 144.0 |

|               |    |        |      |      |
|---------------|----|--------|------|------|
| ALR-59 EW SET | 1  | 1600.0 | 0.0  | 0.0  |
|               | 2  | 1600.0 | 0.0  | 0.0  |
|               | 3  | 1700.0 | 14.2 | 10.6 |
|               | 4  | 1800.0 | 26.3 | 19.7 |
|               | 5  | 1800.0 | 23.0 | 17.2 |
|               | 6  | 0.0    |      |      |
|               | 7  | 0.0    |      |      |
|               | 8  | 0.0    |      |      |
|               | 9  | 0.0    |      |      |
|               | 10 | 0.0    |      |      |
| TOTAL         |    | 8500.0 | 63.4 | 47.6 |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

| PROJECT TITLE        | YEAR | PROJECT COST<br>(\$ THOUSANDS) | NET GAIN (UPPER)<br>(\$ THOUSANDS) | NET GAIN (LOWER)<br>(\$ THOUSANDS) |
|----------------------|------|--------------------------------|------------------------------------|------------------------------------|
| LIGHTWT RF STRIPLINE | 1    | 0.0                            | 0.0                                | 0.0                                |
|                      | 2    | 0.0                            | 0.0                                | 0.0                                |
|                      | 3    | 120.0                          | -10.6                              | -38.0                              |
|                      | 4    | 0.0                            | 202.9                              | 152.2                              |
|                      | 5    | 0.0                            | 208.0                              | 156.0                              |

| PROJECT TITLE       | YEAR | PROJECT COST<br>(\$ THOUSANDS) | NET GAIN<br>(UPPER) | NET GAIN<br>(LOWER) |
|---------------------|------|--------------------------------|---------------------|---------------------|
| LIGHTWAVE STRIPLINE | 1    | 0.0                            | 0.0                 | 0.0                 |
|                     | 2    | 0.0                            | 0.0                 | 0.0                 |
|                     | 3    | 120.0                          | -10.6               | -38.0               |
|                     | 4    | 0.0                            | 202.9               | 152.2               |
|                     | 5    | 0.0                            | 206.0               | 156.0               |
|                     | 6    | 0.0                            | 167.3               | 125.5               |
|                     | 7    | 0.0                            |                     |                     |
|                     | 8    | 0.0                            |                     |                     |
|                     | 9    | 0.0                            |                     |                     |
|                     | 10   | 0.0                            |                     |                     |
| TOTAL               |      | 120.0                          | 567.5               | 395.6               |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.



## MANUFACTURING TECHNOLOGY STUDY --- 06/07/77 -----

## PROJECT - 30 GA-AS ICSMICROMA1218

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|------|-------------------------------|-----------------------------------|-----------------------------------|
| DDG-47 AEGIS                   | 1    | 930000.0                      | 0.0                               | 0.0                               |
|                                | 2    | 0.0                           | 0.0                               | 0.0                               |
|                                | 3    | 1882900.0                     | 0.0                               | 0.0                               |
|                                | 4    | 1945400.0                     | 0.0                               | 0.0                               |
|                                | 5    | 2038300.0                     | 49.9                              | 39.9                              |
|                                | 6    | 0.0                           | 0.0                               | 0.0                               |
|                                | 7    | 1469750.0                     | 41.3                              | 33.0                              |
|                                | 8    | 2292810.0                     | 56.3                              | 45.0                              |
|                                | 9    | 2384520.0                     |                                   |                                   |
|                                | 10   | 826630.0                      |                                   |                                   |
| TOTAL                          |      | 13770310.0                    | 147.5                             | 118.0                             |

|              |    |         |      |      |
|--------------|----|---------|------|------|
| TPS-59 RADAR | 1  | 0.0     | 0.0  | 0.0  |
|              | 2  | 8300.0  | 0.0  | 0.0  |
|              | 3  | 8700.0  | 0.0  | 0.0  |
|              | 4  | 9000.0  | 0.0  | 0.0  |
|              | 5  | 9400.0  | 3.8  | 3.1  |
|              | 6  | 9700.0  | 5.2  | 4.2  |
|              | 7  | 10100.0 | 4.7  | 3.8  |
|              | 8  | 0.0     |      |      |
|              | 9  | 0.0     |      |      |
|              | 10 | 0.0     |      |      |
| TOTAL        |    | 55200.0 | 13.8 | 11.0 |

|              |    |          |     |     |
|--------------|----|----------|-----|-----|
| DTP EN SUITE | 1  | 51100.0  | 0.0 | 0.0 |
|              | 2  | 57600.0  | 0.0 | 0.0 |
|              | 3  | 39400.0  | 0.0 | 0.0 |
|              | 4  | 0.0      | 0.0 | 0.0 |
|              | 5  | 0.0      | 0.0 | 0.0 |
|              | 6  | 0.0      |     |     |
|              | 7  | 0.0      |     |     |
|              | 8  | 0.0      |     |     |
|              | 9  | 0.0      |     |     |
|              | 10 | 0.0      |     |     |
| TOTAL        |    | 148100.0 | 0.0 | 0.0 |

|                |    |        |     |     |
|----------------|----|--------|-----|-----|
| ALQ-76 ECM SET | 1  | 2500.0 | 0.0 | 0.0 |
|                | 2  | 2600.0 | 0.0 | 0.0 |
|                | 3  | 2700.0 | 0.0 | 0.0 |
|                | 4  | 3100.0 | 0.0 | 0.0 |
|                | 5  | 5100.0 | 2.1 | 1.7 |
|                | 6  | 5300.0 | 2.8 | 2.3 |
|                | 7  | 5500.0 | 2.6 | 2.1 |
|                | 8  | 0.0    |     |     |
|                | 9  | 0.0    |     |     |
|                | 10 | 0.0    |     |     |

Note: For comparison purposes all MT  
project savings are terminated after  
four years. In most cases successful  
projects will produce additional  
savings.

| PROJECT TITLE | YEAR | PROJECT COST (\$ THOUSANDS) | NET GAIN (\$ THOUSANDS) (UPPER) | NET GAIN (\$ THOUSANDS) (LOWER) |
|---------------|------|-----------------------------|---------------------------------|---------------------------------|
| ALR-59 EW SET | 1    | 1600.0                      | 0.0                             | 0.0                             |
|               | 2    | 1600.0                      | 0.0                             | 0.0                             |
|               | 3    | 1700.0                      | 0.0                             | 0.0                             |
|               | 4    | 1800.0                      | 0.0                             | 0.0                             |
|               | 5    | 1800.0                      | 0.0                             | 0.0                             |
|               | 6    | 0.0                         | 0.0                             | 0.0                             |
|               | 7    | 0.0                         | 0.0                             | 0.0                             |
|               | 8    | 0.0                         | 0.0                             | 0.0                             |
|               | 9    | 0.0                         | 0.0                             | 0.0                             |
|               | 10   | 0.0                         | 0.0                             | 0.0                             |
| TOTAL         |      | 2600.0                      | 7.5                             | 6.0                             |

| PROJECT TITLE        | YEAR | PROJECT COST (\$ THOUSANDS) | NET GAIN (\$ THOUSANDS) (UPPER) | NET GAIN (\$ THOUSANDS) (LOWER) |
|----------------------|------|-----------------------------|---------------------------------|---------------------------------|
| GA-AS TCSMICRONA1218 | 1    | 0.0                         | 0.0                             | 0.0                             |
|                      | 2    | 0.0                         | 0.0                             | 0.0                             |
|                      | 3    | 500.0                       | -500.0                          | -500.0                          |
|                      | 4    | 500.0                       | -500.0                          | -500.0                          |
|                      | 5    | 0.0                         | 56.6                            | 45.3                            |
|                      | 6    | 0.0                         | 8.0                             | 6.4                             |
|                      | 7    | 0.0                         | 48.6                            | 36.9                            |
|                      | 8    | 0.0                         | 56.3                            | 45.0                            |
|                      | 9    | 0.0                         |                                 |                                 |
|                      | 10   | 0.0                         |                                 |                                 |
| TOTAL                |      | 1000.0                      | -830.5                          | -664.4                          |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

MANUFACTURING TECHNOLOGY STUDY 06/07/77

PROJECT - 39 MNOS MEMORY A1298

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|------|-------------------------------|-----------------------------------|-----------------------------------|
| PRC-104 RADIO                  | 1    | 1600.0                        | 0.0                               | 0.0                               |
|                                | 2    | 1600.0                        | 0.0                               | 0.0                               |
|                                | 3    | -0.0                          | 0.0                               | 0.0                               |
|                                | 4    | -0.0                          | 0.0                               | 0.0                               |
|                                | 5    | -0.0                          | 0.0                               | 0.0                               |
|                                | 6    | -0.0                          | 0.0                               | 0.0                               |
|                                | 7    | -0.0                          | 0.0                               | 0.0                               |
|                                | 8    | -0.0                          | 0.0                               | 0.0                               |
|                                | 9    | -0.0                          | 0.0                               | 0.0                               |
|                                | 10   | -0.0                          | 0.0                               | 0.0                               |
| TOTAL                          |      | 3200.0                        | 0.0                               | 0.0                               |

Note: For comparison purposes all Mt project savings are terminated after four years. In most cases successful projects will produce additional savings.

| PROJECT TITLE     | YEAR | PROJECT COST<br>(\$ THOUSANDS) | NET GAIN (\$ THOUSANDS)<br>(UPPER) | NET GAIN (\$ THOUSANDS)<br>(LOWER) |
|-------------------|------|--------------------------------|------------------------------------|------------------------------------|
| MNOS MEMORY A1298 | 1    | 0.0                            | 0.0                                | 0.0                                |
|                   | 2    | 0.0                            | 0.0                                | 0.0                                |
|                   | 3    | 200.0                          | -200.0                             | -200.0                             |
|                   | 4    | 200.0                          | -200.0                             | -200.0                             |
|                   | 5    | 0.0                            | 0.0                                | 0.0                                |
|                   | 6    | 0.0                            | 0.0                                | 0.0                                |
|                   | 7    | 0.0                            | 0.0                                | 0.0                                |
|                   | 8    | 0.0                            | 0.0                                | 0.0                                |
|                   | 9    | 0.0                            | 0.0                                | 0.0                                |
|                   | 10   | 0.0                            | 0.0                                | 0.0                                |
| TOTAL             |      | 400.0                          | -400.0                             | -400.0                             |

## ----- MANUFACTURING TECHNOLOGY STUDY --- 06/07/77 -----

## PROJECT - 41 AUTOMATED TMT 603A

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|------|-------------------------------|-----------------------------------|-----------------------------------|
| DDC47 AEGIS                    | 1    | 930000.0                      | 0.0                               | 0.0                               |
|                                | 2    | 0.0                           | 0.0                               | 0.0                               |
|                                | 3    | 1882900.0                     | 0.0                               | 0.0                               |
|                                | 4    | 1945400.0                     | 0.0                               | 0.0                               |
|                                | 5    | 2038300.0                     | 390.1                             | 273.1                             |
|                                | 6    | 0.0                           | 0.0                               | 0.0                               |
|                                | 7    | 1469750.0                     | 429.9                             | 300.9                             |
|                                | 8    | 2292810.0                     | 586.2                             | 410.3                             |
|                                | 9    | 2384520.0                     |                                   |                                   |
|                                | 10   | 826630.0                      |                                   |                                   |
| TOTAL                          |      | 13770310.0                    | 1406.1                            | 984.3                             |

|              |    |         |       |      |
|--------------|----|---------|-------|------|
| TPS-59 RADAR | 1  | 0.0     | 0.0   | 0.0  |
|              | 2  | 8300.0  | 0.0   | 0.0  |
|              | 3  | 8700.0  | 0.0   | 0.0  |
|              | 4  | 9000.0  | 0.0   | 0.0  |
|              | 5  | 9400.0  | 30.0  | 21.0 |
|              | 6  | 9700.0  | 54.1  | 37.9 |
|              | 7  | 10100.0 | 49.2  | 34.5 |
|              | 8  | 0.0     |       |      |
|              | 9  | 0.0     |       |      |
|              | 10 | 0.0     |       |      |
| TOTAL        |    | 55200.0 | 133.3 | 93.3 |

Note: For comparison purposes all Mt  
project savings are terminated after  
four years. In most cases successful  
projects will produce additional  
savings.

|              |    |          |     |     |
|--------------|----|----------|-----|-----|
| DTP EW SUITE | 1  | 51100.0  | 0.0 | 0.0 |
|              | 2  | 57600.0  | 0.0 | 0.0 |
|              | 3  | 39400.0  | 0.0 | 0.0 |
|              | 4  | 0.0      | 0.0 | 0.0 |
|              | 5  | 0.0      |     |     |
|              | 6  | 0.0      |     |     |
|              | 7  | 0.0      |     |     |
|              | 8  | 0.0      |     |     |
|              | 9  | 0.0      |     |     |
|              | 10 | 0.0      |     |     |
| TOTAL        |    | 148100.0 | 0.0 | 0.0 |

|                |    |        |      |      |
|----------------|----|--------|------|------|
| ALQ-78 ECM SET | 1  | 2500.0 | 0.0  | 0.0  |
|                | 2  | 2600.0 | 0.0  | 0.0  |
|                | 3  | 2700.0 | 0.0  | 0.0  |
|                | 4  | 3100.0 | 0.0  | 0.0  |
|                | 5  | 5100.0 | 16.3 | 11.4 |
|                | 6  | 5300.0 | 29.6 | 20.7 |
|                | 7  | 5500.0 | 26.8 | 18.8 |
|                | 8  | 0.0    |      |      |
|                | 9  | 0.0    |      |      |
|                | 10 | 0.0    |      |      |



|       |         |      |      |
|-------|---------|------|------|
| 3     | 2700.0  | 0.0  | 0.0  |
| 4     | 3100.0  | 0.0  | 0.0  |
| 5     | 5100.0  | 16.3 | 11.4 |
| 6     | 5300.0  | 29.6 | 20.7 |
| 7     | 5500.0  | 26.8 | 18.8 |
| 8     | 0.0     |      |      |
| 9     | 0.0     |      |      |
| 10    | 0.0     |      |      |
| TOTAL | 26800.0 | 72.6 | 50.8 |

|               |        |     |     |
|---------------|--------|-----|-----|
| ALR-59 EM SET |        |     |     |
| 1             | 1600.0 | 0.0 | 0.0 |
| 2             | 1600.0 | 0.0 | 0.0 |
| 3             | 1700.0 | 0.0 | 0.0 |
| 4             | 1800.0 | 0.0 | 0.0 |
| 5             | 1800.0 | 5.7 | 4.0 |
| 6             | 0.0    |     |     |
| 7             | 0.0    |     |     |
| 8             | 0.0    |     |     |
| 9             | 0.0    |     |     |
| 10            | 0.0    |     |     |
| TOTAL         | 8500.0 | 5.7 | 4.0 |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

| PROJECT TITLE      | YEAR | PROJECT COST (\$ THOUSANDS) | NET GAIN (\$ THOUSANDS)<br>(UPPER) | NET GAIN (\$ THOUSANDS)<br>(LOWER) |
|--------------------|------|-----------------------------|------------------------------------|------------------------------------|
| AUTOMATED TWT 603A | 1    | 0.0                         | 0.0                                | 0.0                                |
|                    | 2    | 0.0                         | 0.0                                | 0.0                                |
|                    | 3    | 150.0                       | -150.0                             | -150.0                             |
|                    | 4    | 225.0                       | -225.0                             | -225.0                             |
|                    | 5    | 0.0                         | 442.1                              | 309.5                              |
|                    | 6    | 0.0                         | 83.6                               | 58.6                               |
|                    | 7    | 0.0                         | 505.9                              | 354.1                              |
|                    | 8    | 0.0                         | 586.2                              | 410.3                              |
|                    | 9    | 0.0                         |                                    |                                    |
|                    | 10   | 0.0                         |                                    |                                    |
| TOTAL              |      | 375.0                       | 1242.8                             | 757.5                              |

## ----- MANUFACTURING TECHNOLOGY STUDY --- 06/07/77 -----

## PROJECT - 44 MACHTOOLCOMPCONTROL

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|------|-------------------------------|-----------------------------------|-----------------------------------|
| BQG-5 SONAR                    | 1    | 142000.0                      | 0.0                               | 0.0                               |
|                                | 2    | 133000.0                      | 0.0                               | 0.0                               |
|                                | 3    | 144000.0                      | 0.0                               | 0.0                               |
|                                | 4    | 132300.0                      | 115.9                             | 61.1                              |
|                                | 5    | 61200.0                       | 93.7                              | 65.6                              |
|                                | 6    | 47700.0                       | 63.8                              | 44.7                              |
|                                | 7    | 66100.0                       | 77.3                              | 54.1                              |
|                                | 8    | 51600.0                       |                                   |                                   |
|                                | 9    | 71500.0                       |                                   |                                   |
|                                | 10   | 74400.0                       |                                   |                                   |
| TOTAL                          |      | 923800.0                      | 350.7                             | 245.5                             |

|              |    |         |      |      |
|--------------|----|---------|------|------|
| SQG-23 SONAR | 1  | 3700.0  | 0.0  | 0.0  |
|              | 2  | 31500.0 | 0.0  | 0.0  |
|              | 3  | 26600.0 | 0.0  | 0.0  |
|              | 4  | 22900.0 | 20.1 | 14.0 |
|              | 5  | 0.0     |      |      |
|              | 6  | 0.0     |      |      |
|              | 7  | 0.0     |      |      |
|              | 8  | 0.0     |      |      |
|              | 9  | 0.0     |      |      |
|              | 10 | 0.0     |      |      |
| TOTAL        |    | 84700.0 | 20.1 | 14.0 |

|              |    |         |     |     |
|--------------|----|---------|-----|-----|
| BOR-21 SONAR | 1  | 11500.0 | 0.0 | 0.0 |
|              | 2  | 12700.0 | 0.0 | 0.0 |
|              | 3  | 2300.0  | 0.0 | 0.0 |
|              | 4  | 900.0   | -8  | -6  |
|              | 5  | 900.0   | 1.4 | 1.0 |
|              | 6  | 0.0     |     |     |
|              | 7  | 0.0     |     |     |
|              | 8  | 0.0     |     |     |
|              | 9  | 0.0     |     |     |
|              | 10 | 0.0     |     |     |
| TOTAL        |    | 28300.0 | 2.2 | 1.5 |

|                |    |         |      |      |
|----------------|----|---------|------|------|
| UYK-7 COMPUTER | 1  | 20176.0 | 0.0  | 0.0  |
|                | 2  | 25958.0 | 0.0  | 0.0  |
|                | 3  | 30920.0 | 0.0  | 0.0  |
|                | 4  | 16378.0 | 14.3 | 10.0 |
|                | 5  | 13626.0 | 20.9 | 14.6 |
|                | 6  | 9616.0  | 12.9 | 9.0  |
|                | 7  | 6580.0  | 7.7  | 5.4  |
|                | 8  | 6843.0  |      |      |
|                | 9  | 7117.0  |      |      |
|                | 10 | 7401.0  |      |      |

Note: For comparison purposes all MT  
project savings are terminated after  
four years. In most cases successful  
projects will produce additional  
savings.

|       |          |      |      |
|-------|----------|------|------|
| 1     | 30920.0  | 0.0  | 0.0  |
| 2     | 16378.0  | 14.3 | 10.0 |
| 3     | 13628.0  | 20.9 | 14.6 |
| 4     | 9616.0   | 12.9 | 9.0  |
| 5     | 6580.0   | 7.7  | 5.4  |
| 6     | 6843.0   |      |      |
| 7     | 7117.0   |      |      |
| 8     | 7401.0   |      |      |
| 9     |          |      |      |
| 10    |          |      |      |
| TOTAL | 152615.0 | 55.8 | 39.0 |

| AVK-14 COMPUTER | 1        | 2     | 3    | 4   | 5   | 6   | 7   | 8   | 9   | 10  | TOTAL |
|-----------------|----------|-------|------|-----|-----|-----|-----|-----|-----|-----|-------|
|                 | 4500.0   | 0.0   | 0.0  | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0   |
|                 | 2000.0   | 0.0   | 0.0  | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0   |
|                 | 16804.0  | 0.0   | 0.0  | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0   |
|                 | 19130.0  | 0.0   | 0.0  | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0   |
|                 | 21678.0  | 0.0   | 0.0  | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0   |
|                 | 24088.0  | 0.0   | 0.0  | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0   |
|                 | 23448.0  | 0.0   | 0.0  | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0   |
|                 | 20710.0  | 0.0   | 0.0  | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0   |
|                 | 21538.0  | 0.0   | 0.0  | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0   |
|                 | 13730.0  | 0.0   | 0.0  | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0   |
| TOTAL           | 167706.0 | 109.6 | 76.7 |     |     |     |     |     |     |     |       |

76.7

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

| PROJECT TITLE          | YEAR | PROJECT COST (\$ THOUSANDS) | NET GAIN (\$ THOUSANDS) (UPPER) | NET GAIN (\$ THOUSANDS) (LOWER) |
|------------------------|------|-----------------------------|---------------------------------|---------------------------------|
| MACH TOOL COMP CONTROL | 1    | 0.0                         | 0.0                             | 0.0                             |
|                        | 2    | 0.0                         | 0.0                             | 0.0                             |
|                        | 3    | 375.0                       | -375.0                          | -375.0                          |
|                        | 4    | 0.0                         | 167.8                           | 117.5                           |
|                        | 5    | 0.0                         | 149.1                           | 104.4                           |
|                        | 6    | 0.0                         | 108.9                           | 76.3                            |
|                        | 7    | 0.0                         | 112.5                           | 78.7                            |
|                        | 8    | 0.0                         |                                 |                                 |
|                        | 9    | 0.0                         |                                 |                                 |
|                        | 10   | 0.0                         |                                 |                                 |
| TOTAL                  |      | 375.0                       | 163.3                           | 1.8                             |

|       |       |        |        |
|-------|-------|--------|--------|
| 1     | 0.0   | 0.0    | 0.0    |
| 2     | 0.0   | 0.0    | 0.0    |
| 3     | 375.0 | -375.0 | -375.0 |
| 4     | 0.0   | 167.8  | 117.5  |
| 5     | 0.0   | 149.1  | 104.4  |
| 6     | 0.0   | 108.9  | 76.3   |
| 7     | 0.0   | 112.5  | 78.7   |
| 8     | 0.0   |        |        |
| 9     | 0.0   |        |        |
| 10    | 0.0   |        |        |
| TOTAL | 375.0 | 163.3  | 1.8    |



## MANUFACTURING TECHNOLOGY STUDY --- 06/07/77

## PROJECT - 45 AUTO STD MACH PROC88

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|------|-------------------------------|-----------------------------------|-----------------------------------|
| 800-5 SONAR                    |      |                               |                                   |                                   |
|                                | 1    | 142000.0                      | 0.0                               | 0.0                               |
|                                | 2    | 133000.0                      | 0.0                               | 0.0                               |
|                                | 3    | 140000.0                      | 0.0                               | 0.0                               |
|                                | 4    | 132300.0                      | 77.2                              | 69.5                              |
|                                | 5    | 61200.0                       | 62.5                              | 56.2                              |
|                                | 6    | 47700.0                       | 42.6                              | 38.3                              |
|                                | 7    | 66100.0                       | 51.6                              | 46.4                              |
|                                | 8    | 51600.0                       |                                   |                                   |
|                                | 9    | 71500.0                       |                                   |                                   |
|                                | 10   | 74400.0                       |                                   |                                   |
| TOTAL                          |      | 923600.0                      | 233.8                             | 210.4                             |

|              |    |         |      |      |
|--------------|----|---------|------|------|
| 800-23 SONAR |    |         |      |      |
|              | 1  | 3700.0  | 0.0  | 0.0  |
|              | 2  | 31500.0 | 0.0  | 0.0  |
|              | 3  | 26600.0 | 0.0  | 0.0  |
|              | 4  | 22900.0 | 13.4 | 12.0 |
|              | 5  | 0.0     |      |      |
|              | 6  | 0.0     |      |      |
|              | 7  | 0.0     |      |      |
|              | 8  | 0.0     |      |      |
|              | 9  | 0.0     |      |      |
|              | 10 | 0.0     |      |      |
| TOTAL        |    | 84700.0 | 13.4 | 12.0 |

|              |    |         |     |     |
|--------------|----|---------|-----|-----|
| 800-21 SONAR |    |         |     |     |
|              | 1  | 11500.0 | 0.0 | 0.0 |
|              | 2  | 12700.0 | 0.0 | 0.0 |
|              | 3  | 2300.0  | 0.0 | 0.0 |
|              | 4  | 900.0   | .5  | .5  |
|              | 5  | 900.0   | .9  | .8  |
|              | 6  | 0.0     |     |     |
|              | 7  | 0.0     |     |     |
|              | 8  | 0.0     |     |     |
|              | 9  | 0.0     |     |     |
|              | 10 | 0.0     |     |     |
| TOTAL        |    | 28300.0 | 1.4 | 1.3 |

|                |    |          |      |      |
|----------------|----|----------|------|------|
| UYK-7 COMPUTER |    |          |      |      |
|                | 1  | 20176.6  | 0.0  | 0.0  |
|                | 2  | 25958.0  | 0.0  | 0.0  |
|                | 3  | 38920.0  | 0.0  | 0.0  |
|                | 4  | 16378.0  | 9.6  | 8.6  |
|                | 5  | 13626.0  | 13.9 | 12.5 |
|                | 6  | 9616.0   | 8.6  | 7.7  |
|                | 7  | 6580.0   | 5.1  | 4.6  |
|                | 8  | 6843.0   |      |      |
|                | 9  | 7117.0   |      |      |
|                | 10 | 7401.0   |      |      |
| TOTAL          |    | 152615.0 | 37.2 | 33.5 |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.



|    |         |      |      |
|----|---------|------|------|
| 1  | 30920.0 | 0.0  | 0.0  |
| 2  | 16378.0 | 0.0  | 0.0  |
| 3  | 13626.0 | 9.6  | 8.6  |
| 4  | 9616.0  | 13.9 | 12.5 |
| 5  | 6580.0  | 8.6  | 7.7  |
| 6  | 6643.0  | 5.1  | 4.6  |
| 7  | 7117.0  |      |      |
| 8  | 7401.0  |      |      |
| 9  |         |      |      |
| 10 |         |      |      |

|       |          |      |      |
|-------|----------|------|------|
| TOTAL | 152615.0 | 37.2 | 33.5 |
|-------|----------|------|------|

|                 |          |      |      |
|-----------------|----------|------|------|
| AYK-14 COMPUTER |          |      |      |
| 1               | 4500.0   | 0.0  | 0.0  |
| 2               | 2000.0   | 0.0  | 0.0  |
| 3               | 16884.0  | 0.0  | 0.0  |
| 4               | 19130.0  | 11.2 | 10.1 |
| 5               | 21678.0  | 22.1 | 19.9 |
| 6               | 28088.0  | 21.5 | 19.3 |
| 7               | 23448.0  | 18.3 | 16.5 |
| 8               | 20710.0  |      |      |
| 9               | 21538.0  |      |      |
| 10              | 13730.0  |      |      |
| TOTAL           | 167706.0 | 73.1 | 65.6 |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

| PROJECT TITLE        | YEAR | PROJECT COST (\$ THOUSANDS) | NET GAIN (\$ THOUSANDS) (UPPER) | NET GAIN (\$ THOUSANDS) (LOWER) |
|----------------------|------|-----------------------------|---------------------------------|---------------------------------|
| AUTO STD MACH PROC33 | 1    | 0.0                         | 0.0                             | 0.0                             |
|                      | 2    | 0.0                         | 0.0                             | 0.0                             |
|                      | 3    | 250.0                       | -250.0                          | -250.0                          |
|                      | 4    | 250.0                       | -136.1                          | -149.3                          |
|                      | 5    | 0.0                         | 99.4                            | 89.5                            |
|                      | 6    | 0.0                         | 72.6                            | 65.4                            |
|                      | 7    | 0.0                         | 75.0                            | 67.5                            |
|                      | 8    | 0.0                         |                                 |                                 |
|                      | 9    | 0.0                         |                                 |                                 |
|                      | 10   | 0.0                         |                                 |                                 |
| TOTAL                |      | 500.0                       | -141.1                          | -177.0                          |

## ----- MANUFACTURING TECHNOLOGY STUDY --- 06/07/77 -----

## PROJECT - 46 AUTOPCBCOMPINSERT

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|------|-------------------------------|-----------------------------------|-----------------------------------|
| 800-5 SONAR                    | 1    | 14200.0                       | 0.0                               | 0.0                               |
|                                | 2    | 13300.0                       | 0.0                               | 0.0                               |
|                                | 3    | 14400.0                       | 0.0                               | 0.0                               |
|                                | 4    | 13230.0                       | 23.2                              | 20.9                              |
|                                | 5    | 61200.0                       | 18.7                              | 16.9                              |
|                                | 6    | 47700.0                       | 12.8                              | 11.5                              |
|                                | 7    | 66100.0                       | 15.5                              | 13.9                              |
|                                | 8    | 51600.0                       |                                   |                                   |
|                                | 9    | 71500.0                       |                                   |                                   |
|                                | 10   | 74400.0                       |                                   |                                   |
| TOTAL                          |      | 923800.0                      | 70.1                              | 63.1                              |

|              |    |         |     |     |
|--------------|----|---------|-----|-----|
| 300-23 SONAR | 1  | 3700.0  | 0.0 | 0.0 |
|              | 2  | 31500.0 | 0.0 | 0.0 |
|              | 3  | 26600.0 | 0.0 | 0.0 |
|              | 4  | 22900.0 | 4.0 | 3.6 |
|              | 5  | 0.0     |     |     |
|              | 6  | 0.0     |     |     |
|              | 7  | 0.0     |     |     |
|              | 8  | 0.0     |     |     |
|              | 9  | 0.0     |     |     |
|              | 10 | 0.0     |     |     |
| TOTAL        |    | 84700.0 | 4.0 | 3.6 |

Note: For comparison purposes all Mt  
project savings are terminated after  
four years. In most cases successful  
projects will produce additional  
savings.

|              |    |         |     |     |
|--------------|----|---------|-----|-----|
| 80R-21 SONAR | 1  | 11500.0 | 0.0 | 0.0 |
|              | 2  | 12700.0 | 0.0 | 0.0 |
|              | 3  | 2300.0  | 0.0 | 0.0 |
|              | 4  | 900.0   | .2  | .1  |
|              | 5  | 900.0   | .3  | .2  |
|              | 6  | 0.0     |     |     |
|              | 7  | 0.0     |     |     |
|              | 8  | 0.0     |     |     |
|              | 9  | 0.0     |     |     |
|              | 10 | 0.0     |     |     |
| TOTAL        |    | 28300.0 | .4  | .4  |

| PROJECT TITLE     | YEAR | PROJECT COST<br>(\$ THOUSANDS) | NET GAIN (\$ THOUSANDS)<br>(UPPER) | NET GAIN (\$ THOUSANDS)<br>(LOWER) |
|-------------------|------|--------------------------------|------------------------------------|------------------------------------|
| AUTOPCBCOMPINSERT | 1    | 0.0                            | 0.0                                | 0.0                                |
|                   | 2    | 0.0                            | 0.0                                | 0.0                                |
|                   | 3    | 50.0                           | -50.0                              | -50.0                              |
|                   | 4    | 0.0                            | 27.3                               | 24.6                               |
|                   | 5    | 0.0                            | 19.0                               | 17.1                               |

| PROJECT TITLE     | YEAR | (S, THOUSANDS) | (UPPER) | (LOWER) |
|-------------------|------|----------------|---------|---------|
| AUTOPCBCOMPINSERT | 1    | 0.0            | 0.0     | 0.0     |
|                   | 2    | 0.0            | 0.0     | 0.0     |
|                   | 3    | 50.0           | -50.0   | -50.0   |
|                   | 4    | 0.0            | 27.3    | 24.6    |
|                   | 5    | 0.0            | 19.0    | 17.1    |
|                   | 6    | 0.0            | 12.8    | 11.5    |
|                   | 7    | 0.0            | 15.5    | 13.9    |
|                   | 8    | 0.0            |         |         |
|                   | 9    | 0.0            |         |         |
|                   | 10   | 0.0            |         |         |
| TOTAL             |      | 50.0           | 24.6    | 17.1    |

Note: For comparison purposes all Mc project savings are terminated after four years. In most cases successful projects will produce additional savings.

## ----- MANUFACTURING TECHNOLOGY STUDY --- 06/07/77 -----

## PROJECT - 47 FLATWIREINERCONNECT

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|------|-------------------------------|-----------------------------------|-----------------------------------|
| 800-5 SONAR                    | 1    | 14200.0                       | 0.0                               | 0.0                               |
|                                | 2    | 13300.0                       | 0.0                               | 0.0                               |
|                                | 3    | 14000.0                       | 0.0                               | 0.0                               |
|                                | 4    | 132300.0                      | 48.3                              | 36.2                              |
|                                | 5    | 61200.0                       | 39.0                              | 29.3                              |
|                                | 6    | 47700.0                       | 26.6                              | 19.9                              |
|                                | 7    | 66100.0                       | 32.2                              | 24.2                              |
|                                | 8    | 51600.0                       |                                   |                                   |
|                                | 9    | 71500.0                       |                                   |                                   |
|                                | 10   | 74000.0                       |                                   |                                   |
| TOTAL                          |      | 923600.0                      | 146.1                             | 109.6                             |

|              |    |         |     |     |
|--------------|----|---------|-----|-----|
| 800-23 SONAR | 1  | 3700.0  | 0.0 | 0.0 |
|              | 2  | 31500.0 | 0.0 | 0.0 |
|              | 3  | 26600.0 | 0.0 | 0.0 |
|              | 4  | 22900.0 | 8.4 | 6.3 |
|              | 5  | 0.0     |     |     |
|              | 6  | 0.0     |     |     |
|              | 7  | 0.0     |     |     |
|              | 8  | 0.0     |     |     |
|              | 9  | 0.0     |     |     |
|              | 10 | 0.0     |     |     |
| TOTAL        |    | 84700.0 | 8.4 | 6.3 |

Note: For comparison purposes all MT  
project savings are terminated after  
four years. In most cases successful  
projects will produce additional  
savings.

|              |    |         |     |     |
|--------------|----|---------|-----|-----|
| BOR-21 SONAR | 1  | 11500.0 | 0.0 | 0.0 |
|              | 2  | 12700.0 | 0.0 | 0.0 |
|              | 3  | 2300.0  | 0.0 | 0.0 |
|              | 4  | 900.0   | .3  | .2  |
|              | 5  | 900.0   | .6  | .4  |
|              | 6  | 0.0     |     |     |
|              | 7  | 0.0     |     |     |
|              | 8  | 0.0     |     |     |
|              | 9  | 0.0     |     |     |
|              | 10 | 0.0     |     |     |
| TOTAL        |    | 28300.0 | .9  | .7  |

| PROJECT TITLE       | YEAR | PROJECT COST<br>(\$ THOUSANDS) | NET GAIN (\$ THOUSANDS)<br>(UPPER) | NET GAIN (\$ THOUSANDS)<br>(LOWER) |
|---------------------|------|--------------------------------|------------------------------------|------------------------------------|
| FLATWIREINERCONNECT | 1    | 0.0                            | 0.0                                | 0.0                                |
|                     | 2    | 0.0                            | 0.0                                | 0.0                                |
|                     | 3    | 75.0                           | -75.0                              | -75.0                              |
|                     | 4    | 0.0                            | 57.0                               | 42.7                               |
|                     | 5    | 0.0                            | 39.6                               | 29.7                               |



| PROJECT TITLE        | YEAR | PROJECT COST<br>(\$ THOUSANDS) | (UPP 3) | NET YEAR ESTIMATED<br>(LOWER) |
|----------------------|------|--------------------------------|---------|-------------------------------|
| FLATWIRE INERCONNECT | 1    | 0.0                            | 0.0     | 0.0                           |
|                      | 2    | 0.0                            | 0.0     | 0.0                           |
|                      | 3    | 75.0                           | -75.0   | -75.0                         |
|                      | 4    | 0.0                            | 57.0    | 42.7                          |
|                      | 5    | 0.0                            | 19.6    | 29.7                          |
|                      | 6    | 0.0                            | 26.6    | 19.9                          |
|                      | 7    | 0.0                            | 32.2    | 24.2                          |
|                      | 8    | 0.0                            |         |                               |
|                      | 9    | 0.0                            |         |                               |
|                      | 10   | 0.0                            |         |                               |
| TOTAL                |      | 75.0                           | 80.4    | 41.5                          |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

## MANUFACTURING TECHNOLOGY STUDY 06/07/77

## PROJECT - 48 SYSTEMIMPROVMENT

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|------|-------------------------------|-----------------------------------|-----------------------------------|
| 800-5 SONAR                    | 1    | 14200.0                       | 0.0                               | 0.0                               |
|                                | 2    | 13300.0                       | 0.0                               | 0.0                               |
|                                | 3    | 14000.0                       | 0.0                               | 0.0                               |
|                                | 4    | 13300.0                       | 0.0                               | 0.0                               |
|                                | 5    | 61200.0                       | 0.0                               | 0.0                               |
|                                | 6    | 47700.0                       | 106.4                             | 79.8                              |
|                                | 7    | 66100.0                       | 257.8                             | 193.3                             |
|                                | 8    | 51600.0                       | 263.8                             | 197.9                             |
|                                | 9    | 71500.0                       | 319.6                             | 239.7                             |
|                                | 10   | 74400.0                       |                                   |                                   |
| TOTAL                          |      | 923800.0                      | 947.6                             | 710.7                             |

|              |    |         |     |     |
|--------------|----|---------|-----|-----|
| 300-23 SONAR | 1  | 3700.0  | 0.0 | 0.0 |
|              | 2  | 31500.0 | 0.0 | 0.0 |
|              | 3  | 26600.0 | 0.0 | 0.0 |
|              | 4  | 22900.0 | 0.0 | 0.0 |
|              | 5  | 0.0     |     |     |
|              | 6  | 0.0     |     |     |
|              | 7  | 0.0     |     |     |
|              | 8  | 0.0     |     |     |
|              | 9  | 0.0     |     |     |
|              | 10 | 0.0     |     |     |
| TOTAL        |    | 84700.0 | 0.0 | 0.0 |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

|              |    |         |     |     |
|--------------|----|---------|-----|-----|
| 800-21 SONAR | 1  | 11500.0 | 0.0 | 0.0 |
|              | 2  | 12700.0 | 0.0 | 0.0 |
|              | 3  | 2300.0  | 0.0 | 0.0 |
|              | 4  | 900.0   | 0.0 | 0.0 |
|              | 5  | 900.0   |     |     |
|              | 6  | 0.0     |     |     |
|              | 7  | 0.0     |     |     |
|              | 8  | 0.0     |     |     |
|              | 9  | 0.0     |     |     |
|              | 10 | 0.0     |     |     |
| TOTAL        |    | 20300.0 | 0.0 | 0.0 |

| PROJECT TITLE    | YEAR | PROJECT COST<br>(\$ THOUSANDS) | NET GAIN (\$ THOUSANDS)<br>(UPPER) | NET GAIN (\$ THOUSANDS)<br>(LOWER) |
|------------------|------|--------------------------------|------------------------------------|------------------------------------|
| SYSTEMIMPROVMENT | 1    | 0.0                            | 0.0                                | 0.0                                |
|                  | 2    | 0.0                            | 0.0                                | 0.0                                |
|                  | 3    | 600.0                          | -600.0                             | -600.0                             |
|                  | 4    | 800.0                          | -800.0                             | -800.0                             |
|                  | 5    | 600.0                          | -600.0                             | -600.0                             |
|                  | 6    | 0.0                            | 106.4                              | 79.8                               |
|                  | 7    | 0.0                            | 257.8                              | 193.3                              |
|                  | 8    | 0.0                            | 263.8                              | 197.9                              |

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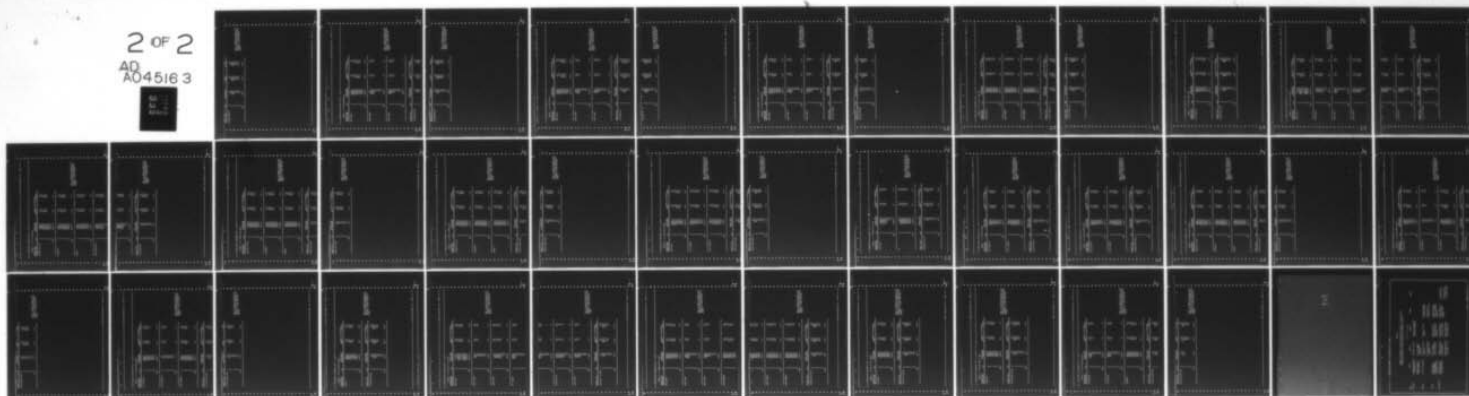
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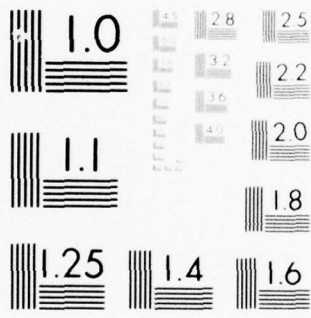
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MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS-1963-A



| PROJECT TITLE      | YEAR | (S. THOUSANDS) | (UPPER) | (LOWER) |
|--------------------|------|----------------|---------|---------|
| SYSTEM IMPROVEMENT | 1    | 0.0            | 0.0     | 0.0     |
|                    | 2    | 0.0            | 0.0     | 0.0     |
|                    | 3    | 600.0          | -600.0  | -600.0  |
|                    | 4    | 800.0          | -800.0  | -800.0  |
|                    | 5    | 600.0          | -600.0  | -600.0  |
|                    | 6    | 0.0            | 106.4   | 79.8    |
|                    | 7    | 0.0            | 257.8   | 193.3   |
|                    | 8    | 0.0            | 263.8   | 197.9   |
|                    | 9    | 0.0            | 319.6   | 239.7   |
|                    | 10   | 0.0            |         |         |
| TOTAL              |      | 2000.0         | -1052.4 | -1269.3 |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

## ----- MANUFACTURING TECHNOLOGY STUDY --- 06/07/77 -----

## PROJECT - 49 MICROPROCREPLCMT

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR  | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|-------|-------------------------------|-----------------------------------|-----------------------------------|
| RQQ-5 SONAR                    |       |                               |                                   |                                   |
|                                | 1     | 142000.0                      | 0.0                               | 0.0                               |
|                                | 2     | 133000.0                      | 0.0                               | 0.0                               |
|                                | 3     | 148000.0                      | 0.0                               | 0.0                               |
|                                | 4     | 132300.0                      | 0.0                               | 0.0                               |
|                                | 5     | 61200.0                       | 106.2                             | 63.7                              |
|                                | 6     | 47700.0                       | 144.7                             | 86.8                              |
|                                | 7     | 66100.0                       | 175.3                             | 105.2                             |
|                                | 8     | 51600.0                       | 119.6                             | 71.8                              |
|                                | 9     | 71500.0                       |                                   |                                   |
|                                | 10    | 74000.0                       |                                   |                                   |
|                                | TOTAL | 923800.0                      | 545.8                             | 327.5                             |

|              |       |         |     |     |
|--------------|-------|---------|-----|-----|
| SQQ-23 SONAR |       |         |     |     |
|              | 1     | 3700.0  | 0.0 | 0.0 |
|              | 2     | 31500.0 | 0.0 | 0.0 |
|              | 3     | 26600.0 | 0.0 | 0.0 |
|              | 4     | 22900.0 | 0.0 | 0.0 |
|              | 5     | 0.0     |     |     |
|              | 6     | 0.0     |     |     |
|              | 7     | 0.0     |     |     |
|              | 8     | 0.0     |     |     |
|              | 9     | 0.0     |     |     |
|              | 10    | 0.0     |     |     |
|              | TOTAL | 84700.0 | 0.0 | 0.0 |

|              |       |         |     |     |
|--------------|-------|---------|-----|-----|
| BOR-21 SONAR |       |         |     |     |
|              | 1     | 11500.0 | 0.0 | 0.0 |
|              | 2     | 12700.0 | 0.0 | 0.0 |
|              | 3     | 2300.0  | 0.0 | 0.0 |
|              | 4     | 900.0   | 0.0 | 0.0 |
|              | 5     | 900.0   | 1.6 | .9  |
|              | 6     | 0.0     |     |     |
|              | 7     | 0.0     |     |     |
|              | 8     | 0.0     |     |     |
|              | 9     | 0.0     |     |     |
|              | 10    | 0.0     |     |     |
|              | TOTAL | 28300.0 | 1.6 | .9  |

Note: For comparison purposes all MT  
project savings are terminated after  
four years. In most cases successful  
projects will produce additional  
savings.

| PROJECT TITLE    | YEAR | PROJECT COST<br>(\$ THOUSANDS) | NET GAIN (\$ THOUSANDS)<br>(UPPER) | NET GAIN (\$ THOUSANDS)<br>(LOWER) |
|------------------|------|--------------------------------|------------------------------------|------------------------------------|
| MICROPROCREPLCMT |      |                                |                                    |                                    |
|                  | 1    | 0.0                            | 0.0                                | 0.0                                |
|                  | 2    | 0.0                            | 0.0                                | 0.0                                |
|                  | 3    | 250.0                          | -250.0                             | -250.0                             |
|                  | 4    | 250.0                          | -250.0                             | -250.0                             |
|                  | 5    | 0.0                            | 107.8                              | 64.7                               |

| PROJECT TITLE    | YEAR | (S. THOUSANDS) | (UPPER) | (LOWER) |
|------------------|------|----------------|---------|---------|
| MICROPROCEPLCHMT | 1    | 0.0            | 0.0     | 0.0     |
|                  | 2    | 0.0            | 0.0     | 0.0     |
|                  | 3    | 250.0          | -250.0  | -250.0  |
|                  | 4    | 250.0          | -250.0  | -250.0  |
|                  | 5    | 0.0            | 107.0   | 64.7    |
|                  | 6    | 0.0            | 144.7   | 64.8    |
|                  | 7    | 0.0            | 175.3   | 105.2   |
|                  | 8    | 0.0            | 119.6   | 71.6    |
|                  | 9    | 0.0            |         |         |
|                  | 10   | 0.0            |         |         |
| TOTAL            |      | 500.0          | 47.3    | -171.6  |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.



MANUFACTURING TECHNOLOGY STUDY --- 06/07/77

PROJECT - 50 AUTO WIRE SYS

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|------|-------------------------------|-----------------------------------|-----------------------------------|
| 800-5 SONAR                    |      |                               |                                   |                                   |
|                                | 1    | 14200.0                       | 0.0                               | 0.0                               |
|                                | 2    | 13300.0                       | 0.0                               | 0.0                               |
|                                | 3    | 14400.0                       | 0.0                               | 0.0                               |
|                                | 4    | 13200.0                       | 0.0                               | 0.0                               |
|                                | 5    | 61200.0                       | 234.3                             | 164.0                             |
|                                | 6    | 47700.0                       | 319.2                             | 223.4                             |
|                                | 7    | 66100.0                       | 580.0                             | 406.0                             |
|                                | 8    | 51600.0                       | 395.6                             | 277.0                             |
|                                | 9    | 71500.0                       |                                   |                                   |
|                                | 10   | 74400.0                       |                                   |                                   |
| TOTAL                          |      | 923600.0                      | 1529.2                            | 1070.4                            |

|              |    |         |     |     |
|--------------|----|---------|-----|-----|
| 300-23 SONAR |    |         |     |     |
|              | 1  | 3700.0  | 0.0 | 0.0 |
|              | 2  | 31500.0 | 0.0 | 0.0 |
|              | 3  | 26600.0 | 0.0 | 0.0 |
|              | 4  | 22900.0 | 0.0 | 0.0 |
|              | 5  | 0.0     |     |     |
|              | 6  | 0.0     |     |     |
|              | 7  | 0.0     |     |     |
|              | 8  | 0.0     |     |     |
|              | 9  | 0.0     |     |     |
|              | 10 | 0.0     |     |     |
| TOTAL        |    | 84700.0 | 0.0 | 0.0 |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

|              |    |         |     |     |
|--------------|----|---------|-----|-----|
| 800-21 SONAR |    |         |     |     |
|              | 1  | 11500.0 | 0.0 | 0.0 |
|              | 2  | 12700.0 | 0.0 | 0.0 |
|              | 3  | 2300.0  | 0.0 | 0.0 |
|              | 4  | 900.0   | 0.0 | 0.0 |
|              | 5  | 900.0   | 3.4 | 2.4 |
|              | 6  | 0.0     |     |     |
|              | 7  | 0.0     |     |     |
|              | 8  | 0.0     |     |     |
|              | 9  | 0.0     |     |     |
|              | 10 | 0.0     |     |     |
| TOTAL        |    | 28300.0 | 3.4 | 2.4 |

| PROJECT TITLE | YEAR | PROJECT COST<br>(\$ THOUSANDS) | NET GAIN (\$ THOUSANDS)<br>(UPPER) | NET GAIN (\$ THOUSANDS)<br>(LOWER) |
|---------------|------|--------------------------------|------------------------------------|------------------------------------|
| AUTO WIRE SYS |      |                                |                                    |                                    |
|               | 1    | 0.0                            | 0.0                                | 0.0                                |
|               | 2    | 0.0                            | 0.0                                | 0.0                                |
|               | 3    | 500.0                          | -500.0                             | -500.0                             |
|               | 4    | 1000.0                         | -1000.0                            | -1000.0                            |
|               | 5    | 1000.0                         | -762.3                             | -633.6                             |
|               | 6    | 0.0                            | 319.2                              | 223.4                              |
|               | 7    | 0.0                            | 580.0                              | 406.0                              |
|               | 8    | 0.0                            | 395.6                              | 277.0                              |



A-30 WIRE SYS

|       |        |         |         |         |
|-------|--------|---------|---------|---------|
| 1     | 0.0    | 0.0     | 0.0     | 0.0     |
| 2     | 0.0    | 0.0     | 0.0     | 0.0     |
| 3     | 500.0  | -500.0  | -500.0  | -500.0  |
| 4     | 1000.0 | -1000.0 | -1000.0 | -1000.0 |
| 5     | 1000.0 | -762.3  | -237.7  | -237.7  |
| 6     | 0.0    | 319.2   | 319.2   | 223.4   |
| 7     | 0.0    | 580.0   | 580.0   | 406.0   |
| 8     | 0.0    | 395.8   | 395.8   | 277.0   |
| 9     | 0.0    |         |         |         |
| 10    | 0.0    |         |         |         |
| TOTAL | 2500.0 | -967.4  | -1427.2 |         |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

----- SCIENCE APPLICATIONS, INC. MCLEAN, VA. -----

## MANUFACTURING TECHNOLOGY STUDY --- 06/07/77

## PROJECT - 51 COMP SHOP INSTRUCT

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|------|-------------------------------|-----------------------------------|-----------------------------------|
| 800-5 SONAR                    | 1    | 14200.0                       | 0.0                               | 0.0                               |
|                                | 2    | 13300.0                       | 0.0                               | 0.0                               |
|                                | 3    | 14400.0                       | 0.0                               | 0.0                               |
|                                | 4    | 132300.0                      | 289.7                             | 202.8                             |
|                                | 5    | 61200.0                       | 117.1                             | 62.0                              |
|                                | 6    | 47700.0                       | 79.8                              | 55.9                              |
|                                | 7    | 66100.0                       | 96.7                              | 67.7                              |
|                                | 8    | 51600.0                       |                                   |                                   |
|                                | 9    | 71500.0                       |                                   |                                   |
|                                | 10   | 74800.0                       |                                   |                                   |
| TOTAL                          |      | 923800.0                      | 583.2                             | 408.3                             |

|              |    |         |      |      |
|--------------|----|---------|------|------|
| 500-23 SONAR | 1  | 3700.0  | 0.0  | 0.0  |
|              | 2  | 31500.0 | 0.0  | 0.0  |
|              | 3  | 26600.0 | 0.0  | 0.0  |
|              | 4  | 22900.0 | 50.1 | 35.1 |
|              | 5  | 0.0     |      |      |
|              | 6  | 0.0     |      |      |
|              | 7  | 0.0     |      |      |
|              | 8  | 0.0     |      |      |
|              | 9  | 0.0     |      |      |
|              | 10 | 0.0     |      |      |
| TOTAL        |    | 84700.0 | 50.1 | 35.1 |

|              |    |         |     |     |
|--------------|----|---------|-----|-----|
| 800-21 SONAR | 1  | 11500.0 | 0.0 | 0.0 |
|              | 2  | 12700.0 | 0.0 | 0.0 |
|              | 3  | 2300.0  | 0.0 | 0.0 |
|              | 4  | 900.0   | 2.0 | 1.4 |
|              | 5  | 900.0   | 1.7 | 1.2 |
|              | 6  | 0.0     |     |     |
|              | 7  | 0.0     |     |     |
|              | 8  | 0.0     |     |     |
|              | 9  | 0.0     |     |     |
|              | 10 | 0.0     |     |     |
| TOTAL        |    | 28300.0 | 3.7 | 2.6 |

| PROJECT TITLE      | YEAR | PROJECT COST<br>(\$ THOUSANDS) | NET GAIN (\$ THOUSANDS)<br>(UPPER) | NET GAIN (\$ THOUSANDS)<br>(LOWER) |
|--------------------|------|--------------------------------|------------------------------------|------------------------------------|
| COMP SHOP INSTRUCT | 1    | 0.0                            | 0.0                                | 0.0                                |
|                    | 2    | 0.0                            | 0.0                                | 0.0                                |
|                    | 3    | 200.0                          | -200.0                             | -200.0                             |
|                    | 4    | 0.0                            | 341.8                              | 239.2                              |
|                    | 5    | 0.0                            | 118.8                              | 83.2                               |
|                    | 6    | 0.0                            | 79.8                               | 55.9                               |
|                    | 7    | 0.0                            | 96.7                               | 67.7                               |
|                    | 8    | 0.0                            |                                    |                                    |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

| PROJECT TITLE      | YEAR | (3, THOUSANDS) | (UPPER) | (LOWER) |
|--------------------|------|----------------|---------|---------|
| COMP SHOP INSTRUCT | 1    | 0.0            | 0.0     | 0.0     |
|                    | 2    | 0.0            | 0.0     | 0.0     |
|                    | 3    | 200.0          | -200.0  | -200.0  |
|                    | 4    | 0.0            | 341.8   | 239.2   |
|                    | 5    | 0.0            | 118.8   | 83.2    |
|                    | 6    | 0.0            | 79.8    | 55.9    |
|                    | 7    | 0.0            | 98.7    | 67.7    |
|                    | 8    | 0.0            |         |         |
|                    | 9    | 0.0            |         |         |
|                    | 10   | 0.0            |         |         |
| TOTAL              |      | 200.0          | 437.1   | 246.0   |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.



## MANUFACTURING TECHNOLOGY STUDY --- 06/07/77

## PROJECT - 58 ENV TEST AUTOMT A211

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|------|-------------------------------|-----------------------------------|-----------------------------------|
| SS041 SONOBUOY                 | 1    | 28500.0                       | 0.0                               | 0.0                               |
|                                | 2    | 29800.0                       | 0.0                               | 0.0                               |
|                                | 3    | 35200.0                       | 0.0                               | 0.0                               |
|                                | 4    | 36300.0                       | 0.0                               | 0.0                               |
|                                | 5    | 36300.0                       | 5.9                               | 4.4                               |
|                                | 6    | 39832.0                       | 8.9                               | 7.1                               |
|                                | 7    | 41425.0                       | 8.1                               | 6.5                               |
|                                | 8    | 43082.0                       | 7.3                               | 5.9                               |
|                                | 9    | 44806.0                       |                                   |                                   |
|                                | 10   | 46598.0                       |                                   |                                   |
| TOTAL                          |      | 383843.0                      | 30.2                              | 23.8                              |

|                |    |          |      |      |
|----------------|----|----------|------|------|
| SS053 SONOBUOY | 1  | 33300.0  | 0.0  | 0.0  |
|                | 2  | 32600.0  | 0.0  | 0.0  |
|                | 3  | 24500.0  | 0.0  | 0.0  |
|                | 4  | 27800.0  | 0.0  | 0.0  |
|                | 5  | 28300.0  | 4.3  | 3.2  |
|                | 6  | 29432.0  | 6.6  | 5.3  |
|                | 7  | 30609.0  | 6.0  | 4.8  |
|                | 8  | 31834.0  | 5.4  | 4.3  |
|                | 9  | 33107.0  |      |      |
|                | 10 | 34431.0  |      |      |
| TOTAL          |    | 305913.0 | 22.3 | 17.6 |

|                |    |          |      |      |
|----------------|----|----------|------|------|
| SS062 SONOBUOY | 1  | 36400.0  | 0.0  | 0.0  |
|                | 2  | 40000.0  | 0.0  | 0.0  |
|                | 3  | 41200.0  | 0.0  | 0.0  |
|                | 4  | 38900.0  | 0.0  | 0.0  |
|                | 5  | 31300.0  | 4.8  | 3.6  |
|                | 6  | 32552.0  | 7.3  | 5.8  |
|                | 7  | 33854.0  | 6.6  | 5.3  |
|                | 8  | 35208.0  | 6.0  | 4.8  |
|                | 9  | 36617.0  |      |      |
|                | 10 | 38081.0  |      |      |
| TOTAL          |    | 364112.0 | 28.7 | 19.5 |

| PROJECT TITLE        | YEAR | PROJECT COST<br>(\$ THOUSANDS) | NET GAIN (\$ THOUSANDS)<br>(UPPER) | NET GAIN (\$ THOUSANDS)<br>(LOWER) |
|----------------------|------|--------------------------------|------------------------------------|------------------------------------|
| ENV TEST AUTOMT A211 | 1    | 0.0                            | 0.0                                | 0.0                                |
|                      | 2    | 0.0                            | 0.0                                | 0.0                                |
|                      | 3    | 300.0                          | -300.0                             | -300.0                             |
|                      | 4    | 400.0                          | -400.0                             | -400.0                             |
|                      | 5    | 400.0                          | -345.0                             | -384.8                             |

Note: For comparison purposes all Mt project savings are terminated after four years. In most cases successful projects will produce additional savings.



| PROJECT TITLE        | YEAR | (S. THOUSANDS) | (UPPER) | (LOWER) |
|----------------------|------|----------------|---------|---------|
| ENV TEST AUTOMT A211 | 1    | 0.0            | 0.0     | 0.0     |
|                      | 2    | 0.0            | 0.0     | 0.0     |
|                      | 3    | 300.0          | -300.0  | -300.0  |
|                      | 4    | 400.0          | -400.0  | -400.0  |
|                      | 5    | 400.0          | -365.0  | -366.8  |
|                      | 6    | 0.0            | 22.7    | 18.2    |
|                      | 7    | 0.0            | 20.6    | 16.5    |
|                      | 8    | 0.0            | 18.8    | 15.0    |
|                      | 9    | 0.0            |         |         |
|                      | 10   | 0.0            |         |         |
| TOTAL                |      | 1100.0         | -1022.9 | -1039.1 |

Note: For comparison purposes all Mt project savings are terminated after four years. In most cases successful projects will produce additional savings.

## ----- MANUFACTURING TECHNOLOGY STUDY --- 06/07/77 -----

## PROJECT - 59 PCB OCR INSP. A266

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|------|-------------------------------|-----------------------------------|-----------------------------------|
| UVK-7 COMPUTER                 | 1    | 20176.0                       | 0.0                               | 0.0                               |
|                                | 2    | 25950.0                       | 0.0                               | 0.0                               |
|                                | 3    | 38920.0                       | 0.0                               | 0.0                               |
|                                | 4    | 16378.0                       | 0.0                               | 0.0                               |
|                                | 5    | 13626.0                       | 0.0                               | 0.0                               |
|                                | 6    | 9616.0                        | 42.9                              | 34.3                              |
|                                | 7    | 6580.0                        | 25.7                              | 20.5                              |
|                                | 8    | 6843.0                        | 23.3                              | 18.7                              |
|                                | 9    | 7117.0                        | 21.2                              | 17.0                              |
|                                | 10   | 7401.0                        |                                   |                                   |
| TOTAL                          |      | 152615.0                      | 113.1                             | 90.5                              |

Note: For comparison purposes all MT  
project savings are terminated after  
four years. In most cases successful  
projects will produce additional  
savings.

| PROJECT TITLE      | YEAR | PROJECT COST<br>(\$ THOUSANDS) | NET GAIN (\$ THOUSANDS)<br>(UPPER) | NET GAIN (\$ THOUSANDS)<br>(LOWER) |
|--------------------|------|--------------------------------|------------------------------------|------------------------------------|
| PCB OCR INSP. A266 | 1    | 0.0                            | 0.0                                | 0.0                                |
|                    | 2    | 0.0                            | 0.0                                | 0.0                                |
|                    | 3    | 200.0                          | -200.0                             | -200.0                             |
|                    | 4    | 300.0                          | -300.0                             | -300.0                             |
|                    | 5    | 300.0                          | -300.0                             | -300.0                             |
|                    | 6    | 0.0                            | 42.9                               | 34.3                               |
|                    | 7    | 0.0                            | 25.7                               | 20.5                               |
|                    | 8    | 0.0                            | 23.3                               | 18.7                               |
|                    | 9    | 0.0                            | 21.2                               | 17.0                               |
|                    | 10   | 0.0                            |                                    |                                    |
| TOTAL              |      | 800.0                          | -686.9                             | -709.5                             |

## ----- MANUFACTURING TECHNOLOGY STUDY --- 06/07/77 -----

PROJECT - 60 NR FLD ANT TST A224

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|------|-------------------------------|-----------------------------------|-----------------------------------|
| DGC47 AEGIS                    | 1    | 930000.0                      | 0.0                               | 0.0                               |
|                                | 2    | 0.0                           | 0.0                               | 0.0                               |
|                                | 3    | 1882900.0                     | 0.0                               | 0.0                               |
|                                | 4    | 1945400.0                     | 340.7                             | 204.4                             |
|                                | 5    | 2038300.0                     | 624.2                             | 374.5                             |
|                                | 6    | 0.0                           | 0.0                               | 0.0                               |
|                                | 7    | 1469750.0                     | 343.9                             | 206.3                             |
|                                | 8    | 2292810.0                     |                                   |                                   |
|                                | 9    | 2384520.0                     |                                   |                                   |
|                                | 10   | 826630.0                      |                                   |                                   |
| TOTAL                          |      | 13770310.0                    | 1308.8                            | 785.3                             |

|              |    |         |       |      |
|--------------|----|---------|-------|------|
| TPS-59 RADAR | 1  | 0.0     | 0.0   | 0.0  |
|              | 2  | 8300.0  | 0.0   | 0.0  |
|              | 3  | 8700.0  | 0.0   | 0.0  |
|              | 4  | 9000.0  | 26.3  | 15.8 |
|              | 5  | 9400.0  | 48.0  | 28.8 |
|              | 6  | 9700.0  | 43.3  | 26.0 |
|              | 7  | 10100.0 | 39.4  | 23.6 |
|              | 8  | 0.0     |       |      |
|              | 9  | 0.0     |       |      |
|              | 10 | 0.0     |       |      |
| TOTAL        |    | 55200.0 | 156.9 | 94.1 |

|              |    |          |     |     |
|--------------|----|----------|-----|-----|
| DTP EM SUITE | 1  | 51100.0  | 0.0 | 0.0 |
|              | 2  | 57600.0  | 0.0 | 0.0 |
|              | 3  | 39400.0  | 0.0 | 0.0 |
|              | 4  | 0.0      |     |     |
|              | 5  | 0.0      |     |     |
|              | 6  | 0.0      |     |     |
|              | 7  | 0.0      |     |     |
|              | 8  | 0.0      |     |     |
|              | 9  | 0.0      |     |     |
|              | 10 | 0.0      |     |     |
| TOTAL        |    | 148100.0 | 0.0 | 0.0 |

|                |    |        |      |      |
|----------------|----|--------|------|------|
| ALQ-78 ECM SET | 1  | 2500.0 | 0.0  | 0.0  |
|                | 2  | 2600.0 | 0.0  | 0.0  |
|                | 3  | 2700.0 | 0.0  | 0.0  |
|                | 4  | 3100.0 | 9.0  | 5.4  |
|                | 5  | 5100.0 | 26.0 | 15.6 |
|                | 6  | 5300.0 | 23.6 | 14.2 |
|                | 7  | 5500.0 | 21.4 | 12.9 |
|                | 8  | 0.0    |      |      |
|                | 9  | 0.0    |      |      |
|                | 10 | 0.0    |      |      |

Note: For comparison purposes all MT  
project savings are terminated after  
four years. In most cases successful  
projects will produce additional  
savings.

| PROJECT TITLE | YEAR | PROJECT COST (\$ THOUSANDS) | NET GAIN (\$ THOUSANDS) (UPPER) | NET GAIN (\$ THOUSANDS) (LOWER) |
|---------------|------|-----------------------------|---------------------------------|---------------------------------|
| ALR-59 EW SET | 1    | 1600.0                      | 0.0                             | 0.0                             |
|               | 2    | 1600.0                      | 0.0                             | 0.0                             |
|               | 3    | 1700.0                      | 0.0                             | 0.0                             |
|               | 4    | 1800.0                      | 5.3                             | 3.2                             |
|               | 5    | 1800.0                      | 9.2                             | 5.5                             |
|               | 6    | 0.0                         | 0.0                             | 0.0                             |
|               | 7    | 0.0                         | 0.0                             | 0.0                             |
|               | 8    | 0.0                         | 0.0                             | 0.0                             |
|               | 9    | 0.0                         | 0.0                             | 0.0                             |
|               | 10   | 0.0                         | 0.0                             | 0.0                             |
| TOTAL         |      | 26000.0                     | 80.2                            | 48.1                            |

| PROJECT TITLE       | YEAR | PROJECT COST (\$ THOUSANDS) | NET GAIN (\$ THOUSANDS) (UPPER) | NET GAIN (\$ THOUSANDS) (LOWER) |
|---------------------|------|-----------------------------|---------------------------------|---------------------------------|
| NR FLD ANT TST A224 | 1    | 0.0                         | 0.0                             | 0.0                             |
|                     | 2    | 0.0                         | 0.0                             | 0.0                             |
|                     | 3    | 250.0                       | -250.0                          | -250.0                          |
|                     | 4    | 250.0                       | 131.3                           | -21.2                           |
|                     | 5    | 0.0                         | 707.3                           | 424.4                           |
|                     | 6    | 0.0                         | 66.9                            | 40.2                            |
|                     | 7    | 0.0                         | 404.7                           | 242.8                           |
|                     | 8    | 0.0                         | 0.0                             | 0.0                             |
|                     | 9    | 0.0                         | 0.0                             | 0.0                             |
|                     | 10   | 0.0                         | 0.0                             | 0.0                             |
| TOTAL               |      | 500.0                       | 1060.3                          | 436.2                           |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.



MANUFACTURING TECHNOLOGY STUDY --- 06/07/77

PROJECT - 67 N/C CALIBRATION

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|------|-------------------------------|-----------------------------------|-----------------------------------|
| STANDARD ER (SM-2)             | 1    | 37800.0                       | 0.0                               | 0.0                               |
|                                | 2    | 39800.0                       | 0.0                               | 0.0                               |
|                                | 3    | 45300.0                       | 0.0                               | 0.0                               |
|                                | 4    | 141200.0                      | 51.9                              | 41.5                              |
|                                | 5    | 144400.0                      | 46.4                              | 37.1                              |
|                                | 6    | 100100.0                      | 28.1                              | 22.5                              |
|                                | 7    | 104100.0                      | 25.6                              | 20.5                              |
|                                | 8    | 108300.0                      |                                   |                                   |
|                                | 9    | 112600.0                      |                                   |                                   |
|                                | 10   | 117100.0                      |                                   |                                   |
| TOTAL                          |      | 950700.0                      | 152.1                             | 121.7                             |

|             |    |           |       |      |
|-------------|----|-----------|-------|------|
| STANDARD MR | 1  | 91200.0   | 0.0   | 0.0  |
|             | 2  | 62600.0   | 0.0   | 0.0  |
|             | 3  | 88600.0   | 0.0   | 0.0  |
|             | 4  | 93900.0   | 34.5  | 27.6 |
|             | 5  | 98700.0   | 31.7  | 25.4 |
|             | 6  | 100500.0  | 28.2  | 22.6 |
|             | 7  | 105200.0  | 25.8  | 20.7 |
|             | 8  | 108700.0  |       |      |
|             | 9  | 113600.0  |       |      |
|             | 10 | 117600.0  |       |      |
| TOTAL       |    | 1000800.0 | 120.4 | 96.3 |

|         |    |          |      |      |
|---------|----|----------|------|------|
| SPARROW | 1  | 45600.0  | 0.0  | 0.0  |
|         | 2  | 48400.0  | 0.0  | 0.0  |
|         | 3  | 82700.0  | 0.0  | 0.0  |
|         | 4  | 82200.0  | 30.2 | 24.2 |
|         | 5  | 84100.0  | 27.0 | 21.6 |
|         | 6  | 32700.0  | 9.2  | 7.4  |
|         | 7  | 34500.0  | 8.5  | 6.8  |
|         | 8  | 35400.0  |      |      |
|         | 9  | 37300.0  |      |      |
|         | 10 | 38300.0  |      |      |
| TOTAL   |    | 521200.0 | 74.9 | 60.0 |

|                   |    |          |      |      |
|-------------------|----|----------|------|------|
| MK15 PHALANX CINS | 1  | 67200.0  | 0.0  | 0.0  |
|                   | 2  | 93800.0  | 0.0  | 0.0  |
|                   | 3  | 85500.0  | 0.0  | 0.0  |
|                   | 4  | 89600.0  | 39.2 | 31.4 |
|                   | 5  | 107000.0 | 41.0 | 32.8 |
|                   | 6  | 111280.0 | 37.2 | 29.8 |
|                   | 7  | 95310.0  | 27.9 | 22.3 |
|                   | 8  | 0.0      |      |      |
|                   | 9  | 0.0      |      |      |
|                   | 10 | 0.0      |      |      |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

|       |          |       |       |
|-------|----------|-------|-------|
| 2     | 91800.0  | 0.0   | 0.0   |
| 3     | 85500.0  | 0.0   | 0.0   |
| 4     | 89600.0  | 30.2  | 31.4  |
| 5     | 107000.0 | 41.0  | 32.8  |
| 6     | 111200.0 | 37.2  | 29.8  |
| 7     | 95310.0  | 27.9  | 22.3  |
| 8     | 0.0      |       |       |
| 9     | 0.0      |       |       |
| 10    | 0.0      |       |       |
| TOTAL | 649690.0 | 145.3 | 116.2 |

| PROJECT TITLE   | YEAR | PROJECT COST<br>(\$ THOUSANDS) | NET GAIN (\$ THOUSANDS)<br>(UPPER) | NET GAIN (\$ THOUSANDS)<br>(LOWER) |
|-----------------|------|--------------------------------|------------------------------------|------------------------------------|
| N/C CALIBRATION | 1    | 0.0                            | 0.0                                | 0.0                                |
|                 | 2    | 0.0                            | 0.0                                | 0.0                                |
|                 | 3    | 30.0                           | -30.0                              | -30.0                              |
|                 | 4    | 0.0                            | 155.9                              | 124.8                              |
|                 | 5    | 0.0                            | 146.2                              | 116.9                              |
|                 | 6    | 0.0                            | 102.8                              | 62.2                               |
|                 | 7    | 0.0                            | 87.8                               | 70.2                               |
|                 | 8    | 0.0                            |                                    |                                    |
|                 | 9    | 0.0                            |                                    |                                    |
|                 | 10   | 0.0                            |                                    |                                    |
| TOTAL           |      | 30.0                           | 462.7                              | 364.1                              |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

## ----- MANUFACTURING TECHNOLOGY STUDY --- 06/07/77 -----

## PROJECT - 68 HYBRID SEAL RINGS

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|------|-------------------------------|-----------------------------------|-----------------------------------|
| STANDARD ER (SM-2)             | 1    | 37800.0                       | 0.0                               | 0.0                               |
|                                | 2    | 39800.0                       | 0.0                               | 0.0                               |
|                                | 3    | 45300.0                       | 0.0                               | 0.0                               |
|                                | 4    | 141200.0                      | 43.3                              | 34.6                              |
|                                | 5    | 144400.0                      | 77.4                              | 61.9                              |
|                                | 6    | 100100.0                      | 46.9                              | 37.5                              |
|                                | 7    | 104100.0                      | 42.6                              | 34.1                              |
|                                | 8    | 108300.0                      |                                   |                                   |
|                                | 9    | 112600.0                      |                                   |                                   |
|                                | 10   | 117100.0                      |                                   |                                   |
| TOTAL                          |      | 950700.0                      | 210.2                             | 160.1                             |

|             |    |           |       |       |
|-------------|----|-----------|-------|-------|
| STANDARD MR | 1  | 91200.0   | 0.0   | 0.0   |
|             | 2  | 82600.0   | 0.0   | 0.0   |
|             | 3  | 88600.0   | 0.0   | 0.0   |
|             | 4  | 93400.0   | 28.8  | 23.0  |
|             | 5  | 98700.0   | 52.9  | 42.3  |
|             | 6  | 100500.0  | 47.1  | 37.7  |
|             | 7  | 105200.0  | 43.1  | 34.5  |
|             | 8  | 108700.0  |       |       |
|             | 9  | 113800.0  |       |       |
|             | 10 | 117600.0  |       |       |
| TOTAL       |    | 1000800.0 | 171.8 | 137.5 |

Note: For comparison purposes all MT  
project savings are terminated after  
four years. In most cases successful  
projects will produce additional  
savings.

|         |    |          |      |      |
|---------|----|----------|------|------|
| SPARROW | 1  | 45600.0  | 0.0  | 0.0  |
|         | 2  | 48400.0  | 0.0  | 0.0  |
|         | 3  | 82700.0  | 0.0  | 0.0  |
|         | 4  | 82200.0  | 25.2 | 20.2 |
|         | 5  | 84100.0  | 45.1 | 36.1 |
|         | 6  | 32700.0  | 15.3 | 12.3 |
|         | 7  | 34500.0  | 14.1 | 11.3 |
|         | 8  | 35400.0  |      |      |
|         | 9  | 37300.0  |      |      |
|         | 10 | 38300.0  |      |      |
| TOTAL   |    | 521200.0 | 99.7 | 79.6 |

| PROJECT TITLE     | YEAR | PROJECT COST<br>(\$ THOUSANDS) | NET GAIN (\$ THOUSANDS)<br>(UPPER) | NET GAIN (\$ THOUSANDS)<br>(LOWER) |
|-------------------|------|--------------------------------|------------------------------------|------------------------------------|
| HYBRID SEAL RINGS | 1    | 0.0                            | 0.0                                | 0.0                                |
|                   | 2    | 0.0                            | 0.0                                | 0.0                                |
|                   | 3    | 70.0                           | -70.0                              | -70.0                              |
|                   | 4    | 0.0                            | 97.3                               | 77.8                               |
|                   | 5    | 0.0                            | 175.3                              | 140.3                              |

| PROJECT TITLE     | YEAR | PROJECT COST<br>(\$ THOUSANDS) | NET GAIN (\$ THOUSANDS)<br>(UPPER) | (LOWER) |
|-------------------|------|--------------------------------|------------------------------------|---------|
| HYBRID SEAL RINGS | 1    | 0.0                            | 0.0                                | 0.0     |
|                   | 2    | 0.0                            | 0.0                                | 0.0     |
|                   | 3    | 70.0                           | -70.0                              | -70.0   |
|                   | 4    | 0.0                            | 97.3                               | 77.6    |
|                   | 5    | 0.0                            | 175.3                              | 140.3   |
|                   | 6    | 0.0                            | 109.3                              | 67.4    |
|                   | 7    | 0.0                            | 99.8                               | 79.9    |
|                   | 8    | 0.0                            |                                    |         |
|                   | 9    | 0.0                            |                                    |         |
|                   | 10   | 0.0                            |                                    |         |
| TOTAL             |      | 70.0                           | 411.7                              | 315.4   |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.



## MANUFACTURING TECHNOLOGY STUDY --- 06/07/77

## PROJECT - 69 PLASTIC MICROW COMP

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|------|-------------------------------|-----------------------------------|-----------------------------------|
| STANDARD ER (SM-2)             | 1    | 37800.0                       | 0.0                               | 0.0                               |
|                                | 2    | 39800.0                       | 0.0                               | 0.0                               |
|                                | 3    | 45300.0                       | 0.0                               | 0.0                               |
|                                | 4    | 141200.0                      | 64.9                              | 58.4                              |
|                                | 5    | 144400.0                      | 116.1                             | 104.5                             |
|                                | 6    | 100100.0                      | 70.3                              | 63.3                              |
|                                | 7    | 104100.0                      | 63.9                              | 57.5                              |
|                                | 8    | 108300.0                      |                                   |                                   |
|                                | 9    | 112600.0                      |                                   |                                   |
|                                | 10   | 117100.0                      |                                   |                                   |
| TOTAL                          |      | 950700.0                      | 315.3                             | 283.7                             |

|             |    |           |       |       |
|-------------|----|-----------|-------|-------|
| STANDARD MR | 1  | 91200.0   | 0.0   | 0.0   |
|             | 2  | 82600.0   | 0.0   | 0.0   |
|             | 3  | 88600.0   | 0.0   | 0.0   |
|             | 4  | 91900.0   | 43.2  | 38.9  |
|             | 5  | 98700.0   | 79.3  | 71.4  |
|             | 6  | 100500.0  | 70.6  | 63.6  |
|             | 7  | 105200.0  | 64.6  | 58.2  |
|             | 8  | 108700.0  |       |       |
|             | 9  | 113800.0  |       |       |
|             | 10 | 117600.0  |       |       |
| TOTAL       |    | 1000800.0 | 257.7 | 232.0 |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

|         |    |          |       |       |
|---------|----|----------|-------|-------|
| SPARROW | 1  | 45600.0  | 0.0   | 0.0   |
|         | 2  | 48400.0  | 0.0   | 0.0   |
|         | 3  | 82700.0  | 0.0   | 0.0   |
|         | 4  | 82200.0  | 37.8  | 34.0  |
|         | 5  | 84100.0  | 67.6  | 60.8  |
|         | 6  | 32700.0  | 23.0  | 20.7  |
|         | 7  | 34500.0  | 21.2  | 19.1  |
|         | 8  | 35400.0  |       |       |
|         | 9  | 37300.0  |       |       |
|         | 10 | 38300.0  |       |       |
| TOTAL   |    | 521200.0 | 149.6 | 134.6 |

| PROJECT TITLE       | YEAR | PROJECT COST<br>(\$ THOUSANDS) | NET GAIN (\$ THOUSANDS)<br>(UPPER) | NET GAIN (\$ THOUSANDS)<br>(LOWER) |
|---------------------|------|--------------------------------|------------------------------------|------------------------------------|
| PLASTIC MICROW COMP | 1    | 0.0                            | 0.0                                | 0.0                                |
|                     | 2    | 0.0                            | 0.0                                | 0.0                                |
|                     | 3    | 140.0                          | -140.0                             | -140.0                             |
|                     | 4    | 0.0                            | 145.9                              | 131.3                              |
|                     | 5    | 0.0                            | 263.0                              | 236.7                              |

| PROJECT TITLE        | YEAR | PROJECT COST<br>(\$ THOUSANDS) | NET GAIN<br>(UPP 1) | NET GAIN<br>(LOWER) |
|----------------------|------|--------------------------------|---------------------|---------------------|
| PLASTIC MICRONV COMP | 1    | 0.0                            | 0.0                 | 0.0                 |
|                      | 2    | 0.0                            | 0.0                 | 0.0                 |
|                      | 3    | 140.0                          | -140.0              | -140.0              |
|                      | 4    | 0.0                            | 145.9               | 131.3               |
|                      | 5    | 0.0                            | 203.0               | 236.7               |
|                      | 6    | 0.0                            | 163.9               | 147.5               |
|                      | 7    | 0.0                            | 149.7               | 134.6               |
|                      | 8    | 0.0                            |                     |                     |
|                      | 9    | 0.0                            |                     |                     |
|                      | 10   | 0.0                            |                     |                     |
| TOTAL                |      | 140.0                          | 502.6               | 510.3               |

Note: For comparison purposes all Mt project savings are terminated after four years. In most cases successful projects will produce additional savings.

## ----- MANUFACTURING TECHNOLOGY STUDY --- 06/07/77 -----

## PROJECT - 70 LASER WELDING CABINT

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|------|-------------------------------|-----------------------------------|-----------------------------------|
| 800-5 SONAR                    | 1    | 14200.0                       | 0.0                               | 0.0                               |
|                                | 2    | 13300.0                       | 0.0                               | 0.0                               |
|                                | 3    | 14800.0                       | 0.0                               | 0.0                               |
|                                | 4    | 13200.0                       | 0.0                               | 0.0                               |
|                                | 5    | 61200.0                       | 136.6                             | 95.7                              |
|                                | 6    | 47700.0                       | 133.0                             | 93.1                              |
|                                | 7    | 66100.0                       | 181.1                             | 112.8                             |
|                                | 8    | 51600.0                       | 109.9                             | 77.0                              |
|                                | 9    | 71500.0                       |                                   |                                   |
|                                | 10   | 74800.0                       |                                   |                                   |
| TOTAL                          |      | 923600.0                      | 540.7                             | 378.5                             |

## UYK-7 COMPUTER

|       |          |      |      |
|-------|----------|------|------|
| 1     | 20176.0  | 0.0  | 0.0  |
| 2     | 25958.0  | 0.0  | 0.0  |
| 3     | 38920.0  | 0.0  | 0.0  |
| 4     | 18378.0  | 0.0  | 0.0  |
| 5     | 13626.0  | 30.4 | 21.3 |
| 6     | 9616.0   | 26.8 | 18.6 |
| 7     | 6580.0   | 16.0 | 11.2 |
| 8     | 6843.0   | 14.6 | 10.2 |
| 9     | 7117.0   |      |      |
| 10    | 7401.0   |      |      |
| TOTAL | 152615.0 | 87.9 | 61.5 |

Note: For comparison purposes all MC  
project savings are terminated after  
four years. In most cases successful  
projects will produce additional  
savings.

## AYK-14 COMPUTER

|       |          |       |       |
|-------|----------|-------|-------|
| 1     | 4500.0   | 0.0   | 0.0   |
| 2     | 2000.0   | 0.0   | 0.0   |
| 3     | 16884.0  | 0.0   | 0.0   |
| 4     | 19130.0  | 0.0   | 0.0   |
| 5     | 21678.0  | 48.4  | 33.9  |
| 6     | 24088.0  | 67.2  | 47.0  |
| 7     | 23448.0  | 57.1  | 40.0  |
| 8     | 20710.0  | 44.1  | 30.9  |
| 9     | 21538.0  |       |       |
| 10    | 13730.0  |       |       |
| TOTAL | 167706.0 | 216.8 | 151.8 |

PROJECT TITLE YEAR PROJECT COST  
(\$ THOUSANDS)

| PROJECT TITLE | YEAR | PROJECT COST<br>(\$ THOUSANDS) | NET GAIN (\$ THOUSANDS)<br>(UPPER) | NET GAIN (\$ THOUSANDS)<br>(LOWER) |
|---------------|------|--------------------------------|------------------------------------|------------------------------------|
|---------------|------|--------------------------------|------------------------------------|------------------------------------|

## LASER WELDING CABINT

|   |       |        |        |
|---|-------|--------|--------|
| 1 | 0.0   | 0.0    | 0.0    |
| 2 | 0.0   | 0.0    | 0.0    |
| 3 | 300.0 | -300.0 | -300.0 |
| 4 | 200.0 | -200.0 | -200.0 |



| PROJECT TITLE         | YEAR | PROJECT COST<br>(3, THOUSANDS) | NET GAIN (S, THOUSANDS)<br>(UPF 3) | (LOWER) |
|-----------------------|------|--------------------------------|------------------------------------|---------|
| LASER WELDING CABINET | 1    | 0.0                            | 0.0                                | 0.0     |
|                       | 2    | 0.0                            | 0.0                                | 0.0     |
|                       | 3    | 300.0                          | -300.0                             | -300.0  |
|                       | 4    | 200.0                          | -200.0                             | -200.0  |
|                       | 5    | 0.0                            | 215.5                              | 150.8   |
|                       | 6    | 0.0                            | 227.0                              | 158.9   |
|                       | 7    | 0.0                            | 234.3                              | 164.0   |
|                       | 8    | 0.0                            | 168.6                              | 118.0   |
|                       | 9    | 0.0                            |                                    |         |
|                       | 10   | 0.0                            |                                    |         |
| TOTAL                 |      | 500.0                          | 345.4                              | 91.8    |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.



## MANUFACTURING TECHNOLOGY STUDY --- 06/07/77

## PROJECT - 71 PROJECTION LITH SAW

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR  | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|-------|-------------------------------|-----------------------------------|-----------------------------------|
| F14A TOMCAT                    | 1     | 727600.0                      | 0.0                               | 0.0                               |
|                                | 2     | 1058800.0                     | 0.0                               | 0.0                               |
|                                | 3     | 1140300.0                     | 0.0                               | 0.0                               |
|                                | 4     | 889300.0                      | 6.2                               | 3.1                               |
|                                | 5     | 761700.0                      | 9.3                               | 6.5                               |
|                                | 6     | 326190.0                      | 3.5                               | 2.4                               |
|                                | 7     | 0.0                           |                                   |                                   |
|                                | 8     | 0.0                           |                                   |                                   |
|                                | 9     | 0.0                           |                                   |                                   |
|                                | 10    | 0.0                           |                                   |                                   |
|                                | TOTAL | 4903890.0                     | 19.1                              | 12.1                              |

|     |       |           |      |      |
|-----|-------|-----------|------|------|
| F10 | 1     | -0.0      | 0.0  | 0.0  |
|     | 2     | 309860.0  | 0.0  | 0.0  |
|     | 3     | 565000.0  | 0.0  | 0.0  |
|     | 4     | 824900.0  | 0.0  | 0.0  |
|     | 5     | 1028800.0 | 12.6 | 8.8  |
|     | 6     | 802480.0  | 8.6  | 6.0  |
|     | 7     | 612000.0  | 5.7  | 4.0  |
|     | 8     | 617190.0  | 5.0  | 3.5  |
|     | 9     | 805560.0  |      |      |
|     | 10    | 688410.0  |      |      |
|     | TOTAL | 6254160.0 | 32.0 | 22.4 |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

| PROJECT TITLE       | YEAR  | PROJECT COST<br>(\$ THOUSANDS) | NET GAIN (\$ THOUSANDS)<br>(UPPER) | NET GAIN (\$ THOUSANDS)<br>(LOWER) |
|---------------------|-------|--------------------------------|------------------------------------|------------------------------------|
| PROJECTION LITH SAW | 1     | 0.0                            | 0.0                                | 0.0                                |
|                     | 2     | 0.0                            | 0.0                                | 0.0                                |
|                     | 3     | 60.0                           | -60.0                              | -60.0                              |
|                     | 4     | 60.0                           | -53.8                              | -56.9                              |
|                     | 5     | 0.0                            | 21.9                               | 15.4                               |
|                     | 6     | 0.0                            | 12.1                               | 8.5                                |
|                     | 7     | 0.0                            | 5.7                                | 4.0                                |
|                     | 8     | 0.0                            | 5.0                                | 3.5                                |
|                     | 9     | 0.0                            |                                    |                                    |
|                     | 10    | 0.0                            |                                    |                                    |
|                     | TOTAL | 120.0                          | -69.0                              | -85.5                              |

TOTAL 120.0 -64.0 -55.5

SCIENCE APPLICATIONS, INC. MCLEAN, VA.

MANUFACTURING TECHNOLOGY STUDY 06/07/77

PROJECT - 73 NC COMP PLACEMENT

| AFFECTED NAVY WEAPON SYSTEM | YEAR | SYSTEM COST (\$ THOUSANDS) | SAVINGS (\$ THOUSANDS) (UPPER) | SAVINGS (\$ THOUSANDS) (LOWER) |
|-----------------------------|------|----------------------------|--------------------------------|--------------------------------|
| UYK-7 COMPUTER              | 1    | 20176.0                    | 0.0                            | 0.0                            |
|                             | 2    | 25958.0                    | 0.0                            | 0.0                            |
|                             | 3    | 38920.0                    | 39.0                           | 29.2                           |
|                             | 4    | 16378.0                    | 28.7                           | 21.5                           |
|                             | 5    | 13626.0                    | 20.9                           | 15.6                           |
|                             | 6    | 9616.0                     | 12.9                           | 9.7                            |
|                             | 7    | 6580.0                     |                                |                                |
|                             | 8    | 683.0                      |                                |                                |
|                             | 9    | 7117.0                     |                                |                                |
|                             | 10   | 7401.0                     |                                |                                |
| TOTAL                       |      | 152615.0                   | 101.4                          | 76.1                           |

| ATK-14 COMPUTER | YEAR | PROJECT COST (\$ THOUSANDS) | NET GAIN (\$ THOUSANDS) (UPPER) | NET GAIN (\$ THOUSANDS) (LOWER) |
|-----------------|------|-----------------------------|---------------------------------|---------------------------------|
|                 | 1    | 4500.0                      | 0.0                             | 0.0                             |
|                 | 2    | 2000.0                      | 0.0                             | 0.0                             |
|                 | 3    | 16884.0                     | 16.9                            | 12.7                            |
|                 | 4    | 19130.0                     | 33.5                            | 25.1                            |
|                 | 5    | 21678.0                     | 33.2                            | 24.9                            |
|                 | 6    | 24088.0                     | 32.2                            | 24.2                            |
|                 | 7    | 23448.0                     |                                 |                                 |
|                 | 8    | 20710.0                     |                                 |                                 |
|                 | 9    | 21538.0                     |                                 |                                 |
|                 | 10   | 13730.0                     |                                 |                                 |
| TOTAL           |      | 167706.0                    | 115.9                           | 86.9                            |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

| PROJECT TITLE     | YEAR | PROJECT COST (\$ THOUSANDS) | NET GAIN (\$ THOUSANDS) (UPPER) | NET GAIN (\$ THOUSANDS) (LOWER) |
|-------------------|------|-----------------------------|---------------------------------|---------------------------------|
| NC COMP PLACEMENT | 1    | 0.0                         | 0.0                             | 0.0                             |
|                   | 2    | 0.0                         | 0.0                             | 0.0                             |
|                   | 3    | 150.0                       | -94.1                           | -108.1                          |
|                   | 4    | 0.0                         | 62.2                            | 46.6                            |
|                   | 5    | 0.0                         | 54.1                            | 40.5                            |
|                   | 6    | 0.0                         | 45.1                            | 33.8                            |
|                   | 7    | 0.0                         |                                 |                                 |
|                   | 8    | 0.0                         |                                 |                                 |
|                   | 9    | 0.0                         |                                 |                                 |
|                   | 10   | 0.0                         |                                 |                                 |
| TOTAL             |      | 150.0                       | 67.3                            | 12.9                            |

SCIENCE APPLICATIONS, INC. MCLEAN, VA.

MANUFACTURING TECHNOLOGY STUDY -- 06/07/77

PROJECT - 74 SEMIAUTO CORE STRONG

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|------|-------------------------------|-----------------------------------|-----------------------------------|
| UYK-7 COMPUTER                 | 1    | 20176.0                       | 0.0                               | 0.0                               |
|                                | 2    | 25958.0                       | 0.0                               | 0.0                               |
|                                | 3    | 38920.0                       | 0.0                               | 0.0                               |
|                                | 4    | 16378.0                       | 14.3                              | 10.8                              |
|                                | 5    | 13626.0                       | 20.9                              | 15.6                              |
|                                | 6    | 9616.0                        | 12.9                              | 9.7                               |
|                                | 7    | 6580.0                        | 7.7                               | 5.8                               |
|                                | 8    | 6843.0                        |                                   |                                   |
|                                | 9    | 7117.0                        |                                   |                                   |
|                                | 10   | 7401.0                        |                                   |                                   |
| TOTAL                          |      | 152615.0                      | 55.8                              | 41.8                              |

|                 |    |          |       |      |
|-----------------|----|----------|-------|------|
| AYK-14 COMPUTER | 1  | 4500.0   | 0.0   | 0.0  |
|                 | 2  | 2000.0   | 0.0   | 0.0  |
|                 | 3  | 16884.0  | 0.0   | 0.0  |
|                 | 4  | 19130.0  | 16.8  | 12.6 |
|                 | 5  | 21678.0  | 33.2  | 24.9 |
|                 | 6  | 24088.0  | 32.2  | 24.2 |
|                 | 7  | 23448.0  | 27.4  | 20.6 |
|                 | 8  | 20710.0  |       |      |
|                 | 9  | 21538.0  |       |      |
|                 | 10 | 13730.0  |       |      |
| TOTAL           |    | 167706.0 | 109.6 | 82.2 |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

| PROJECT TITLE        | YEAR | PROJECT COST<br>(\$ THOUSANDS) | NET GAIN (\$ THOUSANDS)<br>(UPPER) | NET GAIN (\$ THOUSANDS)<br>(LOWER) |
|----------------------|------|--------------------------------|------------------------------------|------------------------------------|
| SEMIAUTO CORE STRONG | 1    | 0.0                            | 0.0                                | 0.0                                |
|                      | 2    | 0.0                            | 0.0                                | 0.0                                |
|                      | 3    | 150.0                          | -150.0                             | -150.0                             |
|                      | 4    | 250.0                          | -218.9                             | -226.7                             |
|                      | 5    | 0.0                            | 54.1                               | 40.5                               |
|                      | 6    | 0.0                            | 45.1                               | 33.8                               |
|                      | 7    | 0.0                            | 35.1                               | 26.3                               |
|                      | 8    | 0.0                            |                                    |                                    |
|                      | 9    | 0.0                            |                                    |                                    |
|                      | 10   | 0.0                            |                                    |                                    |
| TOTAL                |      | 400.0                          | -234.6                             | -276.0                             |



## MANUFACTURING TECHNOLOGY STUDY --- 06/07/77

## PROJECT - 75 IMPVD MOLE ETCH/STRP

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|------|-------------------------------|-----------------------------------|-----------------------------------|
| STANDARD ER (SM-2)             | 1    | 37800.0                       | 0.0                               | 0.0                               |
|                                | 2    | 39800.0                       | 0.0                               | 0.0                               |
|                                | 3    | 45300.0                       | 5.1                               | 2.5                               |
|                                | 4    | 141200.0                      | 27.7                              | 13.0                              |
|                                | 5    | 144400.0                      | 24.8                              | 12.4                              |
|                                | 6    | 100100.0                      | 15.0                              | 7.5                               |
|                                | 7    | 104100.0                      |                                   |                                   |
|                                | 8    | 108300.0                      |                                   |                                   |
|                                | 9    | 112600.0                      |                                   |                                   |
|                                | 10   | 117100.0                      |                                   |                                   |
| TOTAL                          |      | 950700.0                      | 72.5                              | 36.3                              |

|             |    |           |       |      |
|-------------|----|-----------|-------|------|
| STANDARD MR | 1  | 91200.0   | 0.0   | 0.0  |
|             | 2  | 82600.0   | 0.0   | 0.0  |
|             | 3  | 88600.0   | 19.9  | 9.9  |
|             | 4  | 93900.0   | 36.0  | 18.4 |
|             | 5  | 98700.0   | 33.8  | 16.9 |
|             | 6  | 100500.0  | 30.1  | 15.1 |
|             | 7  | 105200.0  |       |      |
|             | 8  | 108700.0  |       |      |
|             | 9  | 113800.0  |       |      |
|             | 10 | 117600.0  |       |      |
| TOTAL       |    | 1000800.0 | 120.7 | 60.4 |

|         |    |          |       |       |
|---------|----|----------|-------|-------|
| SPARROW | 1  | 45600.0  | 0.0   | 0.0   |
|         | 2  | 48800.0  | 0.0   | 0.0   |
|         | 3  | 82700.0  | 46.4  | 23.2  |
|         | 4  | 82300.0  | 80.6  | 40.3  |
|         | 5  | 84100.0  | 72.1  | 36.1  |
|         | 6  | 32700.0  | 24.5  | 12.3  |
|         | 7  | 34500.0  |       |       |
|         | 8  | 35400.0  |       |       |
|         | 9  | 37100.0  |       |       |
|         | 10 | 38300.0  |       |       |
| TOTAL   |    | 521200.0 | 223.6 | 111.6 |

| PROJECT TITLE        | YEAR | PROJECT COST<br>(\$ THOUSANDS) | NET GAIN (\$ THOUSANDS)<br>(UPPER) | NET GAIN (\$ THOUSANDS)<br>(LOWER) |
|----------------------|------|--------------------------------|------------------------------------|------------------------------------|
| IMPVD MOLE ETCH/STRP | 1    | 0.0                            | 0.0                                | 0.0                                |
|                      | 2    | 0.0                            | 0.0                                | 0.0                                |
|                      | 3    | 45.0                           | 26.4                               | -9.3                               |
|                      | 4    | 0.0                            | 145.2                              | 72.6                               |
|                      | 5    | 0.0                            | 130.7                              | 65.4                               |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.



| PROJECT TITLE        | YEAR | PROJECT COST<br>(THOUSANDS) | UPPER | LOWER |
|----------------------|------|-----------------------------|-------|-------|
| IMPVD HOLE ETCH/STRP | 1    | 0.0                         | 0.0   | 0.0   |
|                      | 2    | 0.0                         | 0.0   | 0.0   |
|                      | 3    | 45.0                        | 26.4  | -9.3  |
|                      | 4    | 0.0                         | 145.2 | 72.6  |
|                      | 5    | 0.0                         | 130.7 | 65.4  |
|                      | 6    | 0.0                         | 69.6  | 34.8  |
|                      | 7    | 0.0                         |       |       |
|                      | 8    | 0.0                         |       |       |
|                      | 9    | 0.0                         |       |       |
|                      | 10   | 0.0                         |       |       |
| TOTAL                |      | 45.0                        | 371.9 | 163.4 |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

## ----- MANUFACTURING TECHNOLOGY STUDY --- 06/07/77 -----

## PROJECT - 78 LASR WLDNG-CRE MEMRS

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|------|-------------------------------|-----------------------------------|-----------------------------------|
| UYK-7 COMPUTER                 | 1    | 20176.0                       | 0.0                               | 0.0                               |
|                                | 2    | 25958.0                       | 0.0                               | 0.0                               |
|                                | 3    | 38920.0                       | 0.0                               | 0.0                               |
|                                | 4    | 16378.0                       | 119.5                             | 59.8                              |
|                                | 5    | 13626.0                       | 130.4                             | 91.3                              |
|                                | 6    | 9616.0                        | 80.4                              | 56.3                              |
|                                | 7    | 6580.0                        | 48.1                              | 33.7                              |
|                                | 8    | 6043.0                        |                                   |                                   |
|                                | 9    | 7117.0                        |                                   |                                   |
|                                | 10   | 7401.0                        |                                   |                                   |
| TOTAL                          |      | 152615.0                      | 378.5                             | 241.0                             |

|                 |    |      |     |     |
|-----------------|----|------|-----|-----|
| UYK-20 COMPUTER | 1  | -0.0 | 0.0 | 0.0 |
|                 | 2  | -0.0 | 0.0 | 0.0 |
|                 | 3  | -0.0 | 0.0 | 0.0 |
|                 | 4  | -0.0 | 0.0 | 0.0 |
|                 | 5  | -0.0 | 0.0 | 0.0 |
|                 | 6  | -0.0 | 0.0 | 0.0 |
|                 | 7  | -0.0 | 0.0 | 0.0 |
|                 | 8  | -0.0 | 0.0 | 0.0 |
|                 | 9  | -0.0 | 0.0 | 0.0 |
|                 | 10 | -0.0 | 0.0 | 0.0 |
| TOTAL           |    | 0.0  | 0.0 | 0.0 |

|                 |    |          |       |       |
|-----------------|----|----------|-------|-------|
| AYK-14 COMPUTER | 1  | 4500.0   | 0.0   | 0.0   |
|                 | 2  | 2000.0   | 0.0   | 0.0   |
|                 | 3  | 16884.0  | 0.0   | 0.0   |
|                 | 4  | 19130.0  | 139.6 | 69.8  |
|                 | 5  | 21678.0  | 207.4 | 145.2 |
|                 | 6  | 24088.0  | 201.5 | 141.0 |
|                 | 7  | 23448.0  | 171.4 | 120.0 |
|                 | 8  | 20710.0  |       |       |
|                 | 9  | 21538.0  |       |       |
|                 | 10 | 13730.0  |       |       |
| TOTAL           |    | 167706.0 | 720.0 | 476.1 |

Note: For comparison purposes all MT  
project savings are terminated after  
four years. In most cases successful  
projects will produce additional  
savings.

| PROJECT TITLE        | YEAR | PROJECT COST<br>(\$ THOUSANDS) | NET GAIN (\$ THOUSANDS)<br>(UPPER) | NET GAIN (\$ THOUSANDS)<br>(LOWER) |
|----------------------|------|--------------------------------|------------------------------------|------------------------------------|
| LASR WLDNG-CRE MEMRS | 1    | 0.0                            | 0.0                                | 0.0                                |
|                      | 2    | 0.0                            | 0.0                                | 0.0                                |
|                      | 3    | 75.0                           | -75.0                              | -75.0                              |
|                      | 4    | 75.0                           | 184.1                              | 54.6                               |
|                      | 5    | 0.0                            | 337.8                              | 236.5                              |

| PROJECT TITLE        | YEAR | PROJECT COST<br>(THOUSANDS) | UPPER<br>(THOUSANDS) | NET<br>(THOUSANDS) |
|----------------------|------|-----------------------------|----------------------|--------------------|
| LASR NLONG-CRE WEARS | 1    | 0.0                         | 0.0                  | 0.0                |
|                      | 2    | 0.0                         | 0.0                  | 0.0                |
|                      | 3    | 75.0                        | -75.0                | -75.0              |
|                      | 4    | 75.0                        | 184.1                | 54.6               |
|                      | 5    | 0.0                         | 337.8                | 236.5              |
|                      | 6    | 0.0                         | 281.9                | 197.3              |
|                      | 7    | 0.0                         | 219.6                | 153.7              |
|                      | 8    | 0.0                         |                      |                    |
|                      | 9    | 0.0                         |                      |                    |
|                      | 10   | 0.0                         |                      |                    |
| TOTAL                |      | 150.0                       | 948.4                | 567.1              |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

MANUFACTURING TECHNOLOGY STUDY --- 06/07/77

PROJECT - 74 SLK SCRN PRNTNG PCBS

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|------|-------------------------------|-----------------------------------|-----------------------------------|
| UYK-7 COMPUTER                 | 1    | 20176.0                       | 0.0                               | 0.0                               |
|                                | 2    | 25958.0                       | 0.0                               | 0.0                               |
|                                | 3    | 38920.0                       | 31.2                              | 23.4                              |
|                                | 4    | 16378.0                       | 22.9                              | 17.2                              |
|                                | 5    | 13626.0                       | 16.7                              | 12.5                              |
|                                | 6    | 9616.0                        | 10.3                              | 7.7                               |
|                                | 7    | 6580.0                        |                                   |                                   |
|                                | 8    | 6843.0                        |                                   |                                   |
|                                | 9    | 7117.0                        |                                   |                                   |
|                                | 10   | 7401.0                        |                                   |                                   |
| TOTAL                          |      | 152615.0                      | 81.1                              | 60.8                              |

|                 |    |      |     |     |
|-----------------|----|------|-----|-----|
| UYK-20 COMPUTER | 1  | -0.0 | 0.0 | 0.0 |
|                 | 2  | -0.0 | 0.0 | 0.0 |
|                 | 3  | -0.0 | 0.0 | 0.0 |
|                 | 4  | -0.0 | 0.0 | 0.0 |
|                 | 5  | -0.0 | 0.0 | 0.0 |
|                 | 6  | -0.0 | 0.0 | 0.0 |
|                 | 7  | -0.0 | 0.0 | 0.0 |
|                 | 8  | -0.0 | 0.0 | 0.0 |
|                 | 9  | -0.0 | 0.0 | 0.0 |
|                 | 10 | -0.0 | 0.0 | 0.0 |
| TOTAL           |    | 0.0  | 0.0 | 0.0 |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

|                 |    |          |      |      |
|-----------------|----|----------|------|------|
| AYK-14 COMPUTER | 1  | 4500.0   | 0.0  | 0.0  |
|                 | 2  | 2000.0   | 0.0  | 0.0  |
|                 | 3  | 16884.0  | 13.5 | 10.1 |
|                 | 4  | 19130.0  | 26.8 | 20.1 |
|                 | 5  | 21678.0  | 26.6 | 19.9 |
|                 | 6  | 24088.0  | 25.8 | 19.3 |
|                 | 7  | 23448.0  |      |      |
|                 | 8  | 20710.0  |      |      |
|                 | 9  | 21538.0  |      |      |
|                 | 10 | 13730.0  |      |      |
| TOTAL           |    | 167706.0 | 92.7 | 69.5 |

| PROJECT TITLE        | YEAR | PROJECT COST<br>(\$ THOUSANDS) | NET GAIN (\$ THOUSANDS)<br>(UPPER) | NET GAIN (\$ THOUSANDS)<br>(LOWER) |
|----------------------|------|--------------------------------|------------------------------------|------------------------------------|
| SLK SCRN PRNTNG PCBS | 1    | 0.0                            | 0.0                                | 0.0                                |
|                      | 2    | 0.0                            | 0.0                                | 0.0                                |
|                      | 3    | 150.0                          | -105.3                             | -116.5                             |
|                      | 4    | 0.0                            | 49.8                               | 37.3                               |
|                      | 5    | 0.0                            | 43.2                               | 32.4                               |



| PROJECT TITLE        | YEAR | (THOUSANDS) | (UPPER | OWER)  |
|----------------------|------|-------------|--------|--------|
| SLK SCRN PRNTAG PCDS | 1    | 0.0         | 0.0    | 0.0    |
|                      | 2    | 0.0         | 0.0    | 0.0    |
|                      | 3    | 150.0       | -105.3 | -116.5 |
|                      | 4    | 0.0         | 49.8   | 37.3   |
|                      | 5    | 0.0         | 43.2   | 32.4   |
|                      | 6    | 0.0         | 36.1   | 27.1   |
|                      | 7    | 0.0         |        |        |
|                      | 8    | 0.0         |        |        |
|                      | 9    | 0.0         |        |        |
|                      | 10   | 0.0         |        |        |
| TOTAL                |      | 150.0       | 23.8   | -19.6  |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

MANUFACTURING TECHNOLOGY STUDY --- 06/07/77

PROJECT - 80 OK REACTOR CNG.CAP.

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|------|-------------------------------|-----------------------------------|-----------------------------------|
| PHOENIX                        | 1    | 69200.0                       | 0.0                               | 0.0                               |
|                                | 2    | 79400.0                       | 0.0                               | 0.0                               |
|                                | 3    | 100300.0                      | 0.0                               | 0.0                               |
|                                | 4    | 93800.0                       | 172.5                             | 86.3                              |
|                                | 5    | 90300.0                       | 217.8                             | 108.9                             |
|                                | 6    | 16480.0                       | 46.1                              | 23.0                              |
|                                | 7    | 17100.0                       | 42.0                              | 21.0                              |
|                                | 8    | 18200.0                       |                                   |                                   |
|                                | 9    | 18500.0                       |                                   |                                   |
|                                | 10   | 19200.0                       |                                   |                                   |
| TOTAL                          |      | 522400.0                      | 478.4                             | 239.2                             |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

| PROJECT TITLE       | YEAR | PROJECT COST<br>(\$ THOUSANDS) | NET GAIN (\$ THOUSANDS)<br>(UPPER) | NET GAIN (\$ THOUSANDS)<br>(LOWER) |
|---------------------|------|--------------------------------|------------------------------------|------------------------------------|
| OK REACTOR CNG.CAP. | 1    | 0.0                            | 0.0                                | 0.0                                |
|                     | 2    | 0.0                            | 0.0                                | 0.0                                |
|                     | 3    | 500.0                          | -500.0                             | -500.0                             |
|                     | 4    | 600.0                          | -427.5                             | -513.7                             |
|                     | 5    | 1000.0                         | -782.2                             | -891.1                             |
|                     | 6    | 0.0                            | 46.1                               | 23.0                               |
|                     | 7    | 0.0                            | 42.0                               | 21.0                               |
|                     | 8    | 0.0                            |                                    |                                    |
|                     | 9    | 0.0                            |                                    |                                    |
|                     | 10   | 0.0                            |                                    |                                    |
| TOTAL               |      | 2100.0                         | -1621.6                            | -1860.8                            |

MANUFACTURING TECHNOLOGY STUDY --- 06/07/77

PROJECT - 89 GAAS FET VL IM A6188

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|------|-------------------------------|-----------------------------------|-----------------------------------|
| DUGAT AEGIS                    | 1    | 93000.0                       | 0.0                               | 0.0                               |
|                                | 2    | 0.0                           | 0.0                               | 0.0                               |
|                                | 3    | 188290.0                      | 0.0                               | 0.0                               |
|                                | 4    | 194540.0                      | 27.3                              | 13.6                              |
|                                | 5    | 203830.0                      | 49.9                              | 25.0                              |
|                                | 6    | 0.0                           | 0.0                               | 0.0                               |
|                                | 7    | 146975.0                      | 27.5                              | 13.6                              |
|                                | 8    | 229281.0                      |                                   |                                   |
|                                | 9    | 238452.0                      |                                   |                                   |
|                                | 10   | 826630.0                      |                                   |                                   |
| TOTAL                          |      | 13770310.0                    | 104.7                             | 52.4                              |

|               |    |        |     |     |
|---------------|----|--------|-----|-----|
| PRC-104 RADIO | 1  | 1600.0 | 0.0 | 0.0 |
|               | 2  | 1600.0 | 0.0 | 0.0 |
|               | 3  | -0.0   | 0.0 | 0.0 |
|               | 4  | -0.0   | 0.0 | 0.0 |
|               | 5  | -0.0   |     |     |
|               | 6  | -0.0   |     |     |
|               | 7  | -0.0   |     |     |
|               | 8  | -0.0   |     |     |
|               | 9  | -0.0   |     |     |
|               | 10 | -0.0   |     |     |
| TOTAL         |    | 3200.0 | 0.0 | 0.0 |

|              |    |         |      |     |
|--------------|----|---------|------|-----|
| TPS-59 RADAR | 1  | 0.0     | 0.0  | 0.0 |
|              | 2  | 8300.0  | 0.0  | 0.0 |
|              | 3  | 8700.0  | 0.0  | 0.0 |
|              | 4  | 9000.0  | 2.1  | 1.1 |
|              | 5  | 9400.0  | 3.8  | 1.9 |
|              | 6  | 9700.0  | 3.5  | 1.7 |
|              | 7  | 10100.0 | 3.2  | 1.6 |
|              | 8  | 0.0     |      |     |
|              | 9  | 0.0     |      |     |
|              | 10 | 0.0     |      |     |
| TOTAL        |    | 55200.0 | 12.6 | 6.3 |

|              |    |         |     |     |
|--------------|----|---------|-----|-----|
| DTP EM SUITE | 1  | 51100.0 | 0.0 | 0.0 |
|              | 2  | 57600.0 | 0.0 | 0.0 |
|              | 3  | 39400.0 | 0.0 | 0.0 |
|              | 4  | 0.0     | 0.0 | 0.0 |
|              | 5  | 0.0     |     |     |
|              | 6  | 0.0     |     |     |
|              | 7  | 0.0     |     |     |
|              | 8  | 0.0     |     |     |
|              | 9  | 0.0     |     |     |
|              | 10 | 0.0     |     |     |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.



2 37800.0 0.0 0.0  
 3 39400.0 0.0 0.0  
 4 0.0 0.0 0.0  
 5 0.0 0.0 0.0  
 6 0.0 0.0 0.0  
 7 0.0 0.0 0.0  
 8 0.0 0.0 0.0  
 9 0.0 0.0 0.0  
 10 0.0 0.0 0.0

TOTAL 148100.0 0.0 0.0

ALG-78 ECM SET  
 1 2500.0 0.0 0.0  
 2 2600.0 0.0 0.0  
 3 2700.0 0.0 0.0  
 4 3100.0 .7 .4  
 5 5100.0 2.1 1.0  
 6 5300.0 1.9 .9  
 7 5500.0 1.7 .9  
 8 0.0 0.0 0.0  
 9 0.0 0.0 0.0  
 10 0.0 0.0 0.0

TOTAL 26800.0 6.4 3.2

ALP-59 EM SET  
 1 1600.0 0.0 0.0  
 2 1600.0 0.0 0.0  
 3 1700.0 0.0 0.0  
 4 1800.0 .4 .2  
 5 1800.0 .7 .4  
 6 0.0 0.0 0.0  
 7 0.0 0.0 0.0  
 8 0.0 0.0 0.0  
 9 0.0 0.0 0.0  
 10 0.0 0.0 0.0

TOTAL 8500.0 1.2 .6

Note: For comparison purposes all Mt project savings are terminated after four years. In most cases successful projects will produce additional savings.

PROJECT TITLE YEAR PROJECT COST (S, THOUSANDS) NET GAIN (S, THOUSANDS) (UPPER) (LOWER)

GAAS FET YL IP A6188  
 1 0.0 0.0 0.0  
 2 0.0 0.0 0.0  
 3 650.0 -650.0 -650.0  
 4 650.0 -619.5 -614.7  
 5 0.0 56.6 28.3  
 6 0.0 5.4 2.7  
 7 0.0 32.4 16.2  
 8 0.0 0.0 0.0  
 9 0.0 0.0 0.0  
 10 0.0 0.0 0.0

TOTAL -1300.0 -1175.2 -1237.6



## MANUFACTURING TECHNOLOGY STUDY --- 06/07/77 -----

## PROJECT - 91 PIEZOELEC FILM A6018

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|------|-------------------------------|-----------------------------------|-----------------------------------|
| R00-5 SONAR                    |      |                               |                                   |                                   |
|                                | 1    | 142000.0                      | 0.0                               | 0.0                               |
|                                | 2    | 133000.0                      | 0.0                               | 0.0                               |
|                                | 3    | 140000.0                      | 0.0                               | 0.0                               |
|                                | 4    | 132100.0                      | 0.0                               | 0.0                               |
|                                | 5    | 61200.0                       | 19.5                              | 9.8                               |
|                                | 6    | 47700.0                       | 26.6                              | 13.3                              |
|                                | 7    | 60100.0                       | 32.2                              | 16.1                              |
|                                | 8    | 51600.0                       | 22.0                              | 11.0                              |
|                                | 9    | 71500.0                       |                                   |                                   |
|                                | 10   | 74000.0                       |                                   |                                   |
| TOTAL                          |      | 923600.0                      | 100.3                             | 50.2                              |

|              |    |         |     |     |
|--------------|----|---------|-----|-----|
| S00-23 SONAR |    |         |     |     |
|              | 1  | 3700.0  | 0.0 | 0.0 |
|              | 2  | 31500.0 | 0.0 | 0.0 |
|              | 3  | 26600.0 | 0.0 | 0.0 |
|              | 4  | 22900.0 | 0.0 | 0.0 |
|              | 5  | 0.0     |     |     |
|              | 6  | 0.0     |     |     |
|              | 7  | 0.0     |     |     |
|              | 8  | 0.0     |     |     |
|              | 9  | 0.0     |     |     |
|              | 10 | 0.0     |     |     |
| TOTAL        |    | 84700.0 | 0.0 | 0.0 |

|              |    |         |     |     |
|--------------|----|---------|-----|-----|
| B0R-21 SONAR |    |         |     |     |
|              | 1  | 11500.0 | 0.0 | 0.0 |
|              | 2  | 12700.0 | 0.0 | 0.0 |
|              | 3  | 2300.0  | 0.0 | 0.0 |
|              | 4  | 900.0   | 0.0 | 0.0 |
|              | 5  | 900.0   | .3  | .1  |
|              | 6  | 0.0     |     |     |
|              | 7  | 0.0     |     |     |
|              | 8  | 0.0     |     |     |
|              | 9  | 0.0     |     |     |
|              | 10 | 0.0     |     |     |
| TOTAL        |    | 26300.0 | .3  | .1  |

|                |    |         |      |      |
|----------------|----|---------|------|------|
| S5041 SONOBUDY |    |         |      |      |
|                | 1  | 28500.0 | 0.0  | 0.0  |
|                | 2  | 29600.0 | 0.0  | 0.0  |
|                | 3  | 35200.0 | 0.0  | 0.0  |
|                | 4  | 36300.0 | 0.0  | 0.0  |
|                | 5  | 38300.0 | 12.2 | 6.1  |
|                | 6  | 39632.0 | 22.2 | 11.1 |
|                | 7  | 41425.0 | 20.2 | 10.1 |
|                | 8  | 43082.0 | 18.4 | 9.2  |
|                | 9  | 44806.0 |      |      |
|                | 10 | 46598.0 |      |      |

Note: For comparison purposes all Mx  
project savings are terminated after  
four years. In most cases successful  
projects will produce additional  
savings.

| PROJECT TITLE  | YEAR | PROJECT COST<br>(\$ THOUSANDS) | NET GAIN (\$ THOUSANDS)<br>(UPPER) | NET GAIN (\$ THOUSANDS)<br>(LOWER) |
|----------------|------|--------------------------------|------------------------------------|------------------------------------|
| SS053 SONOBUOY | 1    | 33300.0                        | 0.0                                | 0.0                                |
|                | 2    | 32600.0                        | 0.0                                | 0.0                                |
|                | 3    | 29500.0                        | 0.0                                | 0.0                                |
|                | 4    | 27800.0                        | 0.0                                | 0.0                                |
|                | 5    | 28300.0                        | 0.0                                | 0.0                                |
|                | 6    | 29432.0                        | 16.4                               | 4.5                                |
|                | 7    | 30609.0                        | 14.9                               | 8.2                                |
|                | 8    | 31834.0                        | 13.6                               | 7.5                                |
|                | 9    | 33107.0                        | 13.6                               | 6.6                                |
|                | 10   | 34431.0                        | 13.6                               | 6.6                                |
| TOTAL          |      | 303643.0                       | 73.0                               | 36.5                               |

| PROJECT TITLE  | YEAR | PROJECT COST<br>(\$ THOUSANDS) | NET GAIN (\$ THOUSANDS)<br>(UPPER) | NET GAIN (\$ THOUSANDS)<br>(LOWER) |
|----------------|------|--------------------------------|------------------------------------|------------------------------------|
| SS062 SONOBUOY | 1    | 36400.0                        | 0.0                                | 0.0                                |
|                | 2    | 40000.0                        | 0.0                                | 0.0                                |
|                | 3    | 41200.0                        | 0.0                                | 0.0                                |
|                | 4    | 36900.0                        | 0.0                                | 0.0                                |
|                | 5    | 31300.0                        | 10.0                               | 5.0                                |
|                | 6    | 32552.0                        | 10.2                               | 9.1                                |
|                | 7    | 33654.0                        | 16.5                               | 8.3                                |
|                | 8    | 35208.0                        | 15.0                               | 7.5                                |
|                | 9    | 36617.0                        | 15.0                               | 7.5                                |
|                | 10   | 36681.0                        | 15.0                               | 7.5                                |
| TOTAL          |      | 364112.0                       | 59.6                               | 29.8                               |

| PROJECT TITLE        | YEAR | PROJECT COST<br>(\$ THOUSANDS) | NET GAIN (\$ THOUSANDS)<br>(UPPER) | NET GAIN (\$ THOUSANDS)<br>(LOWER) |
|----------------------|------|--------------------------------|------------------------------------|------------------------------------|
| PIEZOELEC FILM A6010 | 1    | 0.0                            | 0.0                                | 0.0                                |
|                      | 2    | 0.0                            | 0.0                                | 0.0                                |
|                      | 3    | 200.0                          | -200.0                             | -200.0                             |
|                      | 4    | 175.0                          | -175.0                             | -175.0                             |
|                      | 5    | 75.0                           | -24.0                              | -49.5                              |
|                      | 6    | 0.0                            | 83.4                               | 41.7                               |
|                      | 7    | 0.0                            | 83.8                               | 41.9                               |
|                      | 8    | 0.0                            | 68.9                               | 34.5                               |
|                      | 9    | 0.0                            | 68.9                               | 34.5                               |
|                      | 10   | 0.0                            | 68.9                               | 34.5                               |
| TOTAL                |      | 450.0                          | -162.0                             | -306.4                             |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

## ----- MANUFACTURING TECHNOLOGY STUDY ----- 06/07/77 -----

## PROJECT - 92 COMP MAT OPT ASMA301

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|------|-------------------------------|-----------------------------------|-----------------------------------|
| SIDEMINDER                     | 1    | 30600.0                       | 0.0                               | 0.0                               |
|                                | 2    | 27800.0                       | 0.0                               | 0.0                               |
|                                | 3    | 25500.0                       | 0.0                               | 0.0                               |
|                                | 4    | 23000.0                       | 36.6                              | 27.5                              |
|                                | 5    | 24900.0                       | 66.7                              | 50.0                              |
|                                | 6    | 25100.0                       | 58.8                              | 44.1                              |
|                                | 7    | 26100.0                       | 53.4                              | 40.1                              |
|                                | 8    | 27100.0                       |                                   |                                   |
|                                | 9    | 28200.0                       |                                   |                                   |
|                                | 10   | 29300.0                       |                                   |                                   |
| TOTAL                          |      | 268500.0                      | 215.6                             | 161.7                             |

Note: For comparison purposes all MT  
project savings are terminated after  
four years. In most cases successful  
projects will produce additional  
savings.

| PROJECT TITLE        | YEAR | PROJECT COST<br>(\$ THOUSANDS) | NET GAIN (\$ THOUSANDS)<br>(UPPER) | NET GAIN (\$ THOUSANDS)<br>(LOWER) |
|----------------------|------|--------------------------------|------------------------------------|------------------------------------|
| COMP MAT OPT ASMA301 | 1    | 0.0                            | 0.0                                | 0.0                                |
|                      | 2    | 0.0                            | 0.0                                | 0.0                                |
|                      | 3    | 250.0                          | -250.0                             | -250.0                             |
|                      | 4    | 200.0                          | -163.4                             | -172.5                             |
|                      | 5    | 0.0                            | 66.7                               | 50.0                               |
|                      | 6    | 0.0                            | 58.8                               | 44.1                               |
|                      | 7    | 0.0                            | 53.4                               | 40.1                               |
|                      | 8    | 0.0                            |                                    |                                    |
|                      | 9    | 0.0                            |                                    |                                    |
|                      | 10   | 0.0                            |                                    |                                    |
| TOTAL                |      | 450.0                          | -234.4                             | -208.3                             |



MANUFACTURING TECHNOLOGY STUDY 06/07/77

PROJECT - 93 DIAMND TRNED PL A331

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|------|-------------------------------|-----------------------------------|-----------------------------------|
| SIDEMINDER                     |      |                               |                                   |                                   |
|                                | 1    | 30600.0                       | 0.0                               | 0.0                               |
|                                | 2    | 27800.0                       | 0.0                               | 0.0                               |
|                                | 3    | 25500.0                       | 0.0                               | 0.0                               |
|                                | 4    | 23900.0                       | 14.7                              | 11.0                              |
|                                | 5    | 24900.0                       | 33.4                              | 25.0                              |
|                                | 6    | 25100.0                       | 29.4                              | 22.0                              |
|                                | 7    | 26100.0                       | 26.7                              | 20.0                              |
|                                | 8    | 27100.0                       |                                   |                                   |
|                                | 9    | 28200.0                       |                                   |                                   |
|                                | 10   | 29300.0                       |                                   |                                   |
| TOTAL                          |      | 268500.0                      | 104.1                             | 78.1                              |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

| PROJECT TITLE        | YEAR | PROJECT COST<br>(\$ THOUSANDS) | NET GAIN (\$ THOUSANDS)<br>(UPPER) | NET GAIN (\$ THOUSANDS)<br>(LOWER) |
|----------------------|------|--------------------------------|------------------------------------|------------------------------------|
| DIAMND TRNED PL A331 |      |                                |                                    |                                    |
|                      | 1    | 0.0                            | 0.0                                | 0.0                                |
|                      | 2    | 0.0                            | 0.0                                | 0.0                                |
|                      | 3    | 250.0                          | -250.0                             | -250.0                             |
|                      | 4    | 200.0                          | -185.3                             | -189.0                             |
|                      | 5    | 0.0                            | 33.4                               | 25.0                               |
|                      | 6    | 0.0                            | 29.4                               | 22.0                               |
|                      | 7    | 0.0                            | 26.7                               | 20.0                               |
|                      | 8    | 0.0                            |                                    |                                    |
|                      | 9    | 0.0                            |                                    |                                    |
|                      | 10   | 0.0                            |                                    |                                    |
| TOTAL                |      | 450.0                          | -345.9                             | -371.9                             |



## MANUFACTURING TECHNOLOGY STUDY --- 06/07/77

## PROJECT - 97 MLTH.FCL-PL-DET A302

| AFFECTED NAVY<br>WEAPON SYSTEM | YEAR | SYSTEM COST<br>(\$ THOUSANDS) | SAVINGS (\$ THOUSANDS)<br>(UPPER) | SAVINGS (\$ THOUSANDS)<br>(LOWER) |
|--------------------------------|------|-------------------------------|-----------------------------------|-----------------------------------|
| A6E INTRUDER                   | 1    | 137900.0                      | 0.0                               | 0.0                               |
|                                | 2    | 161500.0                      | 0.0                               | 0.0                               |
|                                | 3    | 96500.0                       | 0.0                               | 0.0                               |
|                                | 4    | 0.0                           | 0.0                               | 0.0                               |
|                                | 5    | 0.0                           | 0.0                               | 0.0                               |
|                                | 6    | 0.0                           | 0.0                               | 0.0                               |
|                                | 7    | 0.0                           | 0.0                               | 0.0                               |
|                                | 8    | 0.0                           | 0.0                               | 0.0                               |
|                                | 9    | 0.0                           | 0.0                               | 0.0                               |
|                                | 10   | 0.0                           | 0.0                               | 0.0                               |
| TOTAL                          |      | 415900.0                      | 0.0                               | 0.0                               |

|              |    |          |     |     |
|--------------|----|----------|-----|-----|
| EA6B PROWLER | 1  | 88600.0  | 0.0 | 0.0 |
|              | 2  | 93300.0  | 0.0 | 0.0 |
|              | 3  | 80100.0  | 0.0 | 0.0 |
|              | 4  | 0.0      | 0.0 | 0.0 |
|              | 5  | 0.0      | 0.0 | 0.0 |
|              | 6  | 0.0      | 0.0 | 0.0 |
|              | 7  | 0.0      | 0.0 | 0.0 |
|              | 8  | 0.0      | 0.0 | 0.0 |
|              | 9  | 0.0      | 0.0 | 0.0 |
|              | 10 | 0.0      | 0.0 | 0.0 |
| TOTAL        |    | 262000.0 | 0.0 | 0.0 |

|            |    |          |       |      |
|------------|----|----------|-------|------|
| SIDEWINDER | 1  | 30600.0  | 0.0   | 0.0  |
|            | 2  | 27800.0  | 0.0   | 0.0  |
|            | 3  | 25500.0  | 0.0   | 0.0  |
|            | 4  | 23900.0  | 0.0   | 0.0  |
|            | 5  | 24900.0  | 33.4  | 16.7 |
|            | 6  | 25100.0  | 58.8  | 29.4 |
|            | 7  | 26100.0  | 53.4  | 26.7 |
|            | 8  | 27100.0  | 48.5  | 24.2 |
|            | 9  | 28200.0  |       |      |
|            | 10 | 29300.0  |       |      |
| TOTAL      |    | 266500.0 | 194.1 | 97.0 |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

| PROJECT TITLE        | YEAR | PROJECT COST<br>(\$ THOUSANDS) | NET GAIN (\$ THOUSANDS)<br>(UPPER) | NET GAIN (\$ THOUSANDS)<br>(LOWER) |
|----------------------|------|--------------------------------|------------------------------------|------------------------------------|
| MLTH.FCL-PL-DET A302 | 1    | 0.0                            | 0.0                                | 0.0                                |
|                      | 2    | 0.0                            | 0.0                                | 0.0                                |
|                      | 3    | 300.0                          | -300.0                             | -300.0                             |
|                      | 4    | 250.0                          | -250.0                             | -250.0                             |
|                      | 5    | 0.0                            | 33.4                               | 16.7                               |

| PROJECT TITLE        | YEAR | PROJECT COST<br>(THOUSANDS) | UPPER  | (INCR) |
|----------------------|------|-----------------------------|--------|--------|
| PLTH-FCL-PL-DET A302 | 1    | 0.0                         | 0.0    | 0.0    |
|                      | 2    | 0.0                         | 0.0    | 0.0    |
|                      | 3    | 300.0                       | -300.0 | -300.0 |
|                      | 4    | 250.0                       | -250.0 | -250.0 |
|                      | 5    |                             | 31.4   | 16.7   |
|                      | 6    |                             | 58.8   | 29.4   |
|                      | 7    |                             | 53.4   | 26.7   |
|                      | 8    |                             | 48.5   | 24.2   |
|                      | 9    |                             |        |        |
|                      | 10   |                             |        |        |
| TOTAL                |      | 550.0                       | -355.9 | -453.0 |

Note: For comparison purposes all MT project savings are terminated after four years. In most cases successful projects will produce additional savings.

TABLE 5

and

TABLE 6



# MANUFACTURING TECHNOLOGY STUDY

Table 5

Summary Forecasts of Key Technology Thrusts - Sources IEEE Spectrum, MTAG 76, ECOM Electronic MT Meeting, Mar 77

| Area      | T I M E P E R I O D   |  |  |  |
|-----------|---|--|--|--|
|           | 1978-79   | 1980-81  | 1982-84  | 1985-87  |
| Materials | <ul style="list-style-type: none"> <li>• Liquid crystal display in widespread use</li> <li>• Sapphire costs reduced dramatically</li> </ul> | <ul style="list-style-type: none"> <li>• CMOS/SOS available</li> <li>• III, VI Compound crystal growth economical</li> </ul>   | <ul style="list-style-type: none"> <li>• GaAs, and InP material available economically</li> </ul>  |  |
|           | <ul style="list-style-type: none"> <li>• <math>I^2L</math> logic introduced</li> </ul>  | <ul style="list-style-type: none"> <li>• Low cost OCR devices available</li> <li>• LSI substitutes for electronics modules available</li> </ul>                              | <ul style="list-style-type: none"> <li>• Fiber optic cables economic</li> </ul>  | <ul style="list-style-type: none"> <li>• Josephson function devices available</li> <li>• Solid State TW amplifier available</li> </ul>   |
|           | <ul style="list-style-type: none"> <li>• Hard software, packaged applications programs on semiconductor chips</li> </ul>                    | <ul style="list-style-type: none"> <li>• Fully automated optical inspection systems introduced</li> </ul>  | <ul style="list-style-type: none"> <li>• Optical data bus architecture used with microprocessors interfaces</li> </ul>   | <ul style="list-style-type: none"> <li>• Integrated system design - cabinets, cables, electronics components</li> </ul>  |
| Systems   | <ul style="list-style-type: none"> <li>• Widespread laser machinery (hole boring, welding, etc.)</li> </ul>                                 | <ul style="list-style-type: none"> <li>• Standardized Hybrid manufacturing equipment available</li> <li>• CAM introduced in the electronics industry successfully</li> </ul> | <ul style="list-style-type: none"> <li>• CAD/CAM interface successfully made in electronic industry</li> <li>• Group Technology used successfully in electronics industry</li> </ul> | <ul style="list-style-type: none"> <li>• Robotic assembly of electronics systems a practical reality</li> <li>• 0.1 micron line width available</li> <li>• Widespread use of Ion, and/or E-beam in IC manufacture</li> </ul> |



## MANUFACTURING TECHNOLOGY STUDY

Table 6. Selected Advanced Technology Projects

| <u>#</u> | <u>Title</u>                           |
|----------|--|
| 3)       | Group Technology                       |
| 10)      | Interactive Fault Isolation Hardware   |
| 17)      | Ion Beam Resistor Trimming             |
| 21)      | E-Beam IC Mask Preparation             |
| 24)      | Low Cost Ion Implementation Machine    |
| 33)      | FaAs FET/TWT Replacement (high power)  |
| 38)      | GaAs Microwave Circuits                |
| 65)      | Ribbon Sapphire                        |
| 70)      | Laser Welding (cabinets)               |
| 81)      | Automation Interface-Standardization   |
| 82)      | Hierarchical Control Program/Robotics  |
| 83)      | Tacticle/Visual Sensor in Robotic Arms |
| 84)      | Reembodiment of Semiconductor in LSI   |
| 85)      | Integrated Fiber Optics (airframes)    |
| 88)      | III-V Compound Crystal Growth          |
| 98)      | CMOS/SOS Manufacturability             |